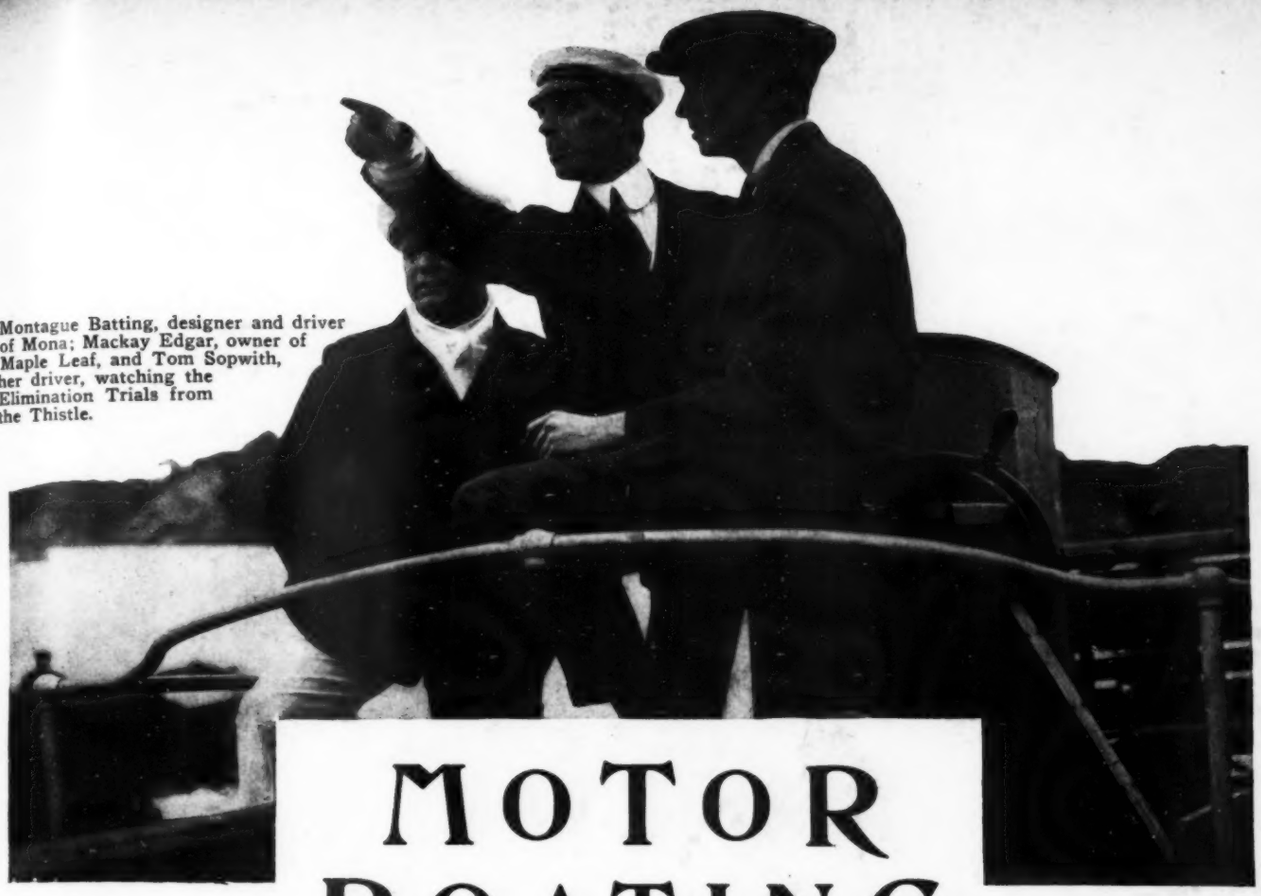
CTOBER
1912

MOTOR BOATING

10
CENTS



Montague Batting, designer and driver of Mona; Mackay Edgar, owner of Maple Leaf, and Tom Sopwith, her driver, watching the Elimination Trials from the Thistle.

MOTOR BOATING

October 1912

The cover picture on this issue was enlarged from an actual photograph taken by Mr. Nutting at the start of the final race of the International series. It shows the 20-foot Baby II overtaking and passing Maple Leaf, the powerful 40-foot challenger.

The National Magazine of Motor Boating

October, 1912 — MOTOR BOATING — Vol. X No. 4

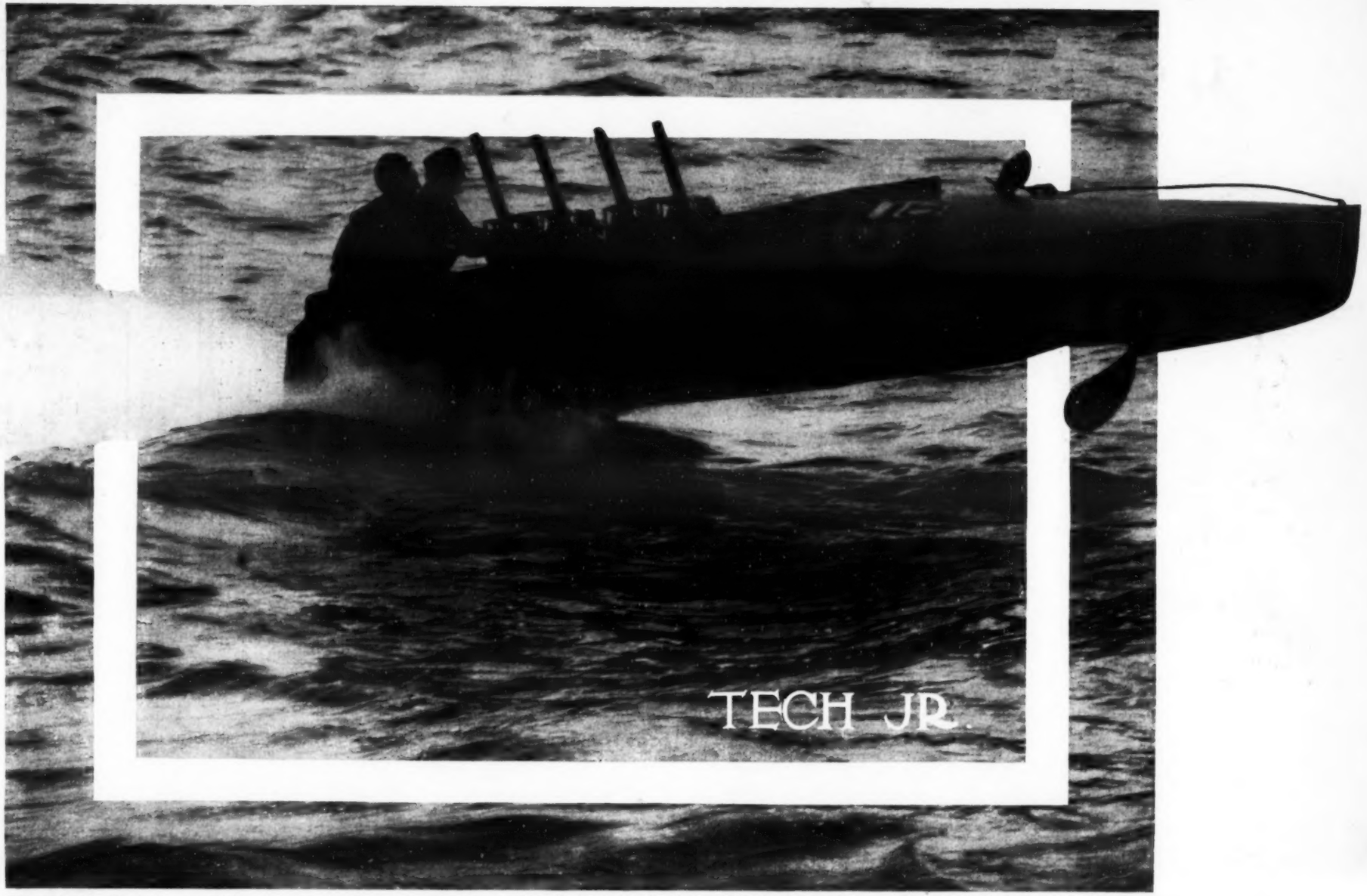
Entered as second-class matter at New York, N. Y., Post Office.

Published Monthly by NEW PUBLICATION COMPANY,
381 FOURTH AVENUE, NEW YORK CITY

G. L. Willson, President — George van Utassy, Treasurer — C. J. Shearn, Secretary

Telephone: 7100 Madison Square — Cable Address: Motoria

10 *cents a copy.* *Subscription,* $1.00 *a year.* European Agents: Saarbach's News Exchange, Mainz, Germany.



The 20-footer, Tech Jr., owned by Coleman Du Pont, was prominent in the elimination and mile speed trials at Huntington. She was built by Adolph Apel and is powered with a six-cylinder 125-h.p. Van Blerck engine.

Bull Moose with a 30-horsepower Roberts engine.

The National Carnival

Bug, the 16-foot Elco-plane.

An Event Held on the Hudson River at the Yonkers Yacht Club for the Splendid Trophies Offered by the National Association of Engine and Boat Manufacturers.

THE annual series of races for the trophies offered by the National Association of Engine and Boat Manufacturers was this year brought back to the Hudson River, after the absence of one year, when the experiment of holding them at Huntington, Long Island, was tried with not over-great success. The reason for leaving the Hudson was the omnipresent driftwood that is so destructive to the frail body of the present racing boat, while the rough water encountered at the 1911 course was hardly preferable to the former evil. An attempt to avoid the drift this year was made by moving the scene of the races some ten miles up stream to Yonkers, where it was expected the river would be more or less clear of that undesirable element, but it proved in general to be less, rather than more, and so the association will probably look for a new camping ground for 1913.

The races were again, as in the past, under the auspices of the Motor Boat Club of America. Why this particular organization should be given the running of the event, it is hard to see. This club has been subjected to the criticisms of the press on its methods of handling races for years past, yet it goes on in the same old way without any attempt at making good. This year proved no exception; in fact things were worse rather than showing any noticeable improvement. The regatta committee did not put in appearance during the entire week, and had it not been for one or two spectators volunteering their assistance on the spur of the moment, there would probably have been no races at all.

The Yonkers Yacht Club kindly offered the use of its house and anchorage at Glenwood, which was accepted, but they were without authority or incentive to push the meet, being allotted no part in the committee or in the work. Commodore Wigley, of the Yonkers Club, was on hand ready to do his share, but aside from him no official of the Motor Boat Club of America showed any interest whatever in making the

Table Showing the Official Measurements of the Contestants

Class A—Racing Boats Under 40 Feet.

Boat.	Owner.	L.O.A.	L.W.L.	M.S. Area.	Make of Engine.	Bore and Stroke.	No. of Cyl.	H.P.	Rating.
Bull Moose	F. J. Gregory	18.18	17.77	1.91	Roberts	4½x5	4	31.2	73.8
Bug	A. E. Smith								73.44
Edith II	A. V. Smith		19.83		Elco	5 x4¾	4	31.08	70.38
Flinders	C. B. Rice	22	21.82	1.85	Continental	4¾x4½	4	21.28	67.86
Gunfire Jr.	W. J. Brainard	19.6	19.6	2.255	Mercury	5⅛x5	4	34.37	76.5
Humpty Dumpty	E. L. Jahncke								72.9
Limit	H. S. Ford	26	25.85	3.21	Peerless	4¾x5	6	46.65	75.56
Muirmaid	P. A. Proal	19.6	18.9	2.525	F.I.A.T.	5½x5⅛	4	40.58	74.16
Mike's Dream	T. Faaron	22.65	22.5	1.745	Emerson	5 x5	6	57.8	97.02
Vita	Mrs. J. S. Blackton		19.79		Humber	4⅜x5	4	25.08	66.06

Class B—Racing Boats Over 40 Feet.

Big Balaam	F. Bailey	40.1	39.3	5.45	Speedway	6¾x8	6	108.04	81.0

Class C—Hydroplanes.

Dubutante	N. Sampson	25.1	23.4	2.975	Thornycroft	4 x7	4	25.1	64.8
Peter Pan V	J. Simpson	20			Van Blerck	5 x6	8		
Tech Jr.	T. C. DuPont	20	19.17	3.275	Sterling	5½x6¾	8	95.04	90.36

Class D—Cruisers Over 60 Feet in Length.

Avis	F. C. Havens	65.43	65.18		Craig	9 x10	4	84.83	64.62
Caroline	M. F. Dennis	66.15	58.42	25.37	Holmes	6 x8½	6	56.54	46.31

Class E—Cruisers Between 40 and 60 Feet in Length.

Lady Betty	H. J. Russel	40.1	38.17	17.4	Automatic	5½x7	4	31.68	40.32
A. Meitz	A. Meitz	44.97	44.22	12.46	Kerosene	8 x10	2	40.6	50.76
Peter Pan Sr.	J. Simpson	40.08	39.75	5.59	Continental	5 x5	8	43.62	65.95
Spindrift	C. R. Butler	41.2	40.2	12.68	Ralaco	5 x7	4	26.17	42.3

Class F—Cruisers Under 40 Feet in Length.

Alfred S.	H. Soeldner	25.58	23.67	8.30	Metropolitan	5 x5½	1	7.05	28.89
Canadice	L. A. Servatins	39.82	37.68	15.47	20th Century	5¾x7¼	4	34.62	43.1
Empire	J. L. Luckenbach	34.33	30.0	6.76	Van Blerck	5 x6	4	26.16	49.8
Idle Time	M. B. Behrman		36.77	9.13	Sterling	4⅜x5½	4		

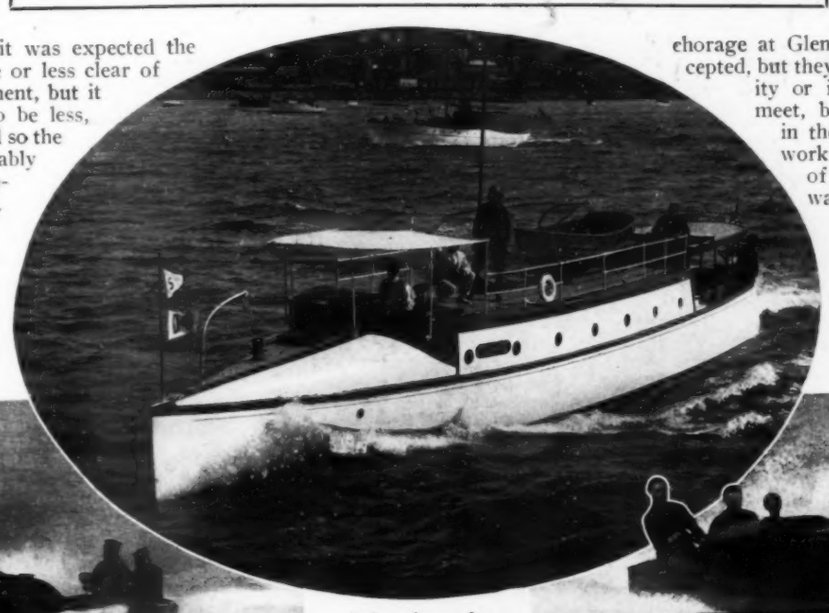
Class G—Open Boats Under 30 Feet in Length.

Alamel	T. Mellor		20.3	2.58	Watertown	3¾x3¾	4	10.82	47.9
Bunk III	C. Firth	21.02	20.0	2.68	Watertown	3¾x3¾	4	5.42	37.44
Elm	W. R. Munro	22.4	20	4.21	Fulton	4¾x5	1	5.2	31.68
Geraldine	H. M. Wise	20.42	19.45	2.967	Kermath	4 x4	2	9.62	41.95
Gray Hare	A. Haas		20.43		Gray	4¾x4	2	13.88	45.3
Valiant II	J. Sauer	21	20.75	3.635	Metropolitan	3½x4	2	5.02	33.2

Class J—Open Boats Over 30 Feet in Length.

Elise	T. Kick		27.83	3.25	Atlantic	4¼x4½	3	12.5	49.06
Esolaine II	J. H. Flagler		38.79	4.62	Jencick	7½x7½	4	88.36	89.1
Greyhound	L. G. Lloyd		35.33	3.54	————	5 x6	4	26.16	63.5

Vita, Mrs. Blackton's tender, again won in her class.



Avis, winner for many years, again defeated Caroline, shown in the background.

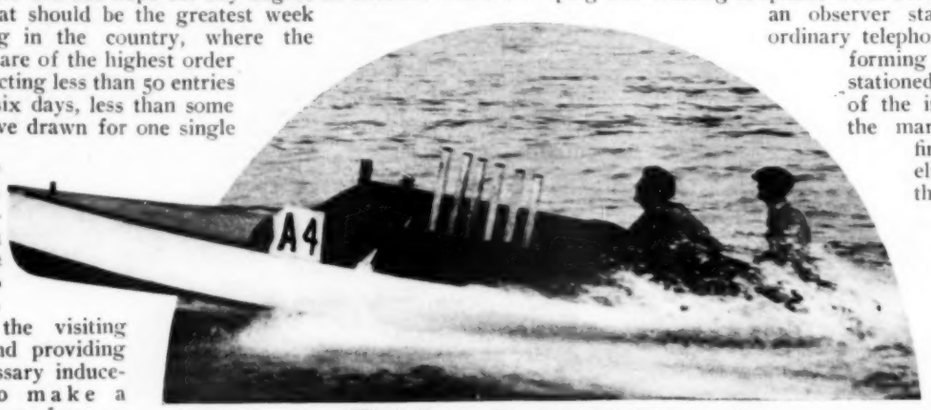
Muir Maid, a fast Doyle hydroplane.

Commodore J. Stuart Blackton, of the Atlantic Yacht Club, very kindly offered the use of his motor yacht, Paula, for the committee boat for the entire week, which was one redeeming feature of the arrangements. Until the manufacturers give the carnival to some live, wideawake club to handle, with full power to see it through to the end, and be responsible for its success, no one can hope for any degree of success. Here we have what should be the greatest week of racing in the country, where the trophies are of the highest order but attracting less than 50 entries for the six days, less than some clubs have drawn for one single day.

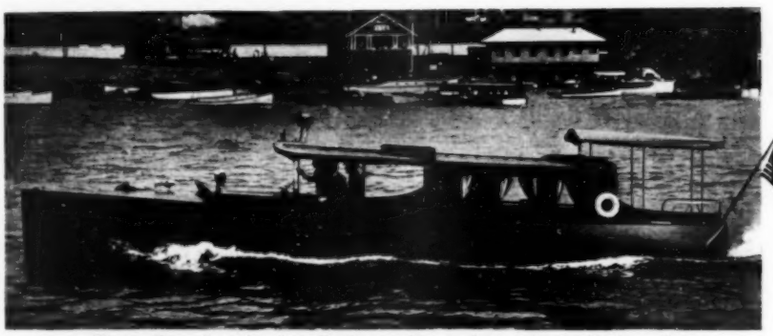
For success some attention must be given to entertaining the visiting crews and providing the necessary inducements to make a journey from a distant point and several days away from business worth while.

The usual groups of series races were arranged this year, calling for three races on as many days for three classes of cruisers, two of open boats, two of racing boats and one of hydroplanes. The point system of scoring was used whereby a boat received a point for finishing and one for every boat she defeated. Scoring each day was based on the largest number of boats starting any day. The series races were all handicap affairs based on the 1912 American Power Boat Association Rules which in the racing boat class are very different from those used heretofore and tend to favor the longer boat more than the older rules did. As practically all the boats in this class were of uniform length, there was not a good chance to demonstrate the purpose of the change.

The usual long distance races for cruisers and speed boats were again held, but the results were not remarkable as the hydroplanes did not enter, due probably to the inability to carry a sufficient amount of fuel for the trip and the number of cruisers was below that of years gone by. Classes were arranged for the first time for the 20, 26 and 32 feet restricted classes and a 60-mile handicap race for speed boats with handicaps based on the actual performance made in any previous race earlier in the week was another innovation which proved a popular one.



Mike's Dream, Tom Farron's latest creation.



Peter Pan, Sr., the fast Reliance day cruiser, winner in her class.

John Sauer again produces a winner, this time an open boat, Valiant II.

Peter Pan V, James Simpson's 20-foot hydro.

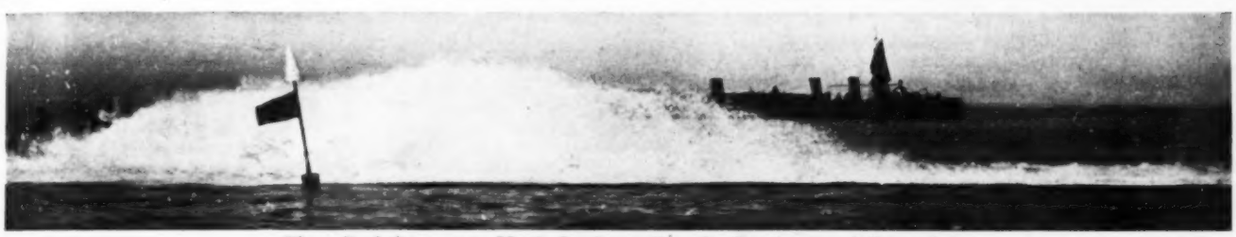
Credit should be given for at least one point in the arrangements and that is the care that was exercised in laying off the one nautical mile straightway course for the mile trials. The City engineers of Yonkers did the work, placing two permanent alignment marks at each end which assured a course of absolutely the correct length. Arrangements were made for tapping into existing telephone wires between the two marks, and an observer stationed at each with an ordinary telephone head receiver by informing the timers which were stationed altogether at one point, of the instant the boats passed the marks, either starting or finishing it was possible to eliminate the confusion that existed at the Huntington trials when some reports credited Tech, Jr., with over 58 miles an hour.

In the hydroplane class Peter Pan V, owned by James Simpson, had every thing her own way, the only other boats starting were put out of the running by accidents. Tech, Jr., Coleman Du Pont's monoplane, was Peter Pan's only rival in the first race, but was over half a minute late getting away at the start. She slowly gained on Peter Pan until the turning marks at the end of the second leg of the first round were reached when the two hydroplanes were on almost equal terms, but as Tech, Jr., attempted to round the marks on the outside of the other racer, the wash from Peter Pan caught her, throwing her completely over bottom side up. The crew climbed onto her bottom where they sat for some minutes until she sank. A monoplane having a forward rudder like Tech, Jr., has the peculiarity that she leans outward when rounding a mark just opposite to a boat equipped with rudders at the stern and the waves from Peter Pan caught the hull just right to throw her all the way over.

Driftwood and rough water again played an important part in the races for the Class A speed boats. The races of this class scheduled for the first day had to be called off entirely due to a stiff norther that blew down the Hudson and churned up mighty billows. This class was badly handicapped on the other days by drift that put several of the boats out entirely. Little Vita, Mrs. Blackton's champion, was again winner in this class without much trouble on corrected time. This year she has the Humber engine, formerly in Vita, Jr., and goes better than ever. Muir Maid,

(*Continued on page 64*)

Maple Leaf IV, the successful challenger, crossing the line at the finish of the last race.



The tail of the comet—Maple Leaf rounding the first buoy at full speed.

How We Lost the Trophy.

The International Races for the Harmsworth Trophy, Something About the Boats and Some of the Possible Reasons for the Failures of the American Team.

By Wm. Washburn Nutting.

Photographs by Levick, Rosenfeld and the writer.

IF you can't win, the next best thing is to be beaten by a real adversary, and this is what happened to us at Huntington when Maple Leaf IV won back the Harmsworth Trophy for England. It takes two qualifications to win: speed and dependability. We had the former, the brilliant rather temperamental performances of Baby Reliance II in her previous races left no one in doubt of that; and both she and Ankle Deep, with her almost equal speed, proved themselves faster boats than Maple Leaf with all her 760 horsepower. But Maple Leaf had the latter quality and it was this that took the Trophy back to England.

Not that Maple Leaf is a slow boat by any means, for she is decidedly a fast one, but besides this she is a rational, "well rounded" craft as any boat must be to run a 30-mile race in any reasonable weather.

Those hardy ones who surmounted the difficulties of inadequate transportation facilities and managed to be present at the Elimination "Trials" (and verily it's a survival of the fittest, this getting out to Huntington Bay) were not altogether hopeful of success; for, although there was never gathered together a more interesting lot of motor craft, there was still nothing definite, nothing sure, nothing that one could point to and say "she'll do."

In the first place the boats as a whole were undersized, not that length makes much difference in a hydroplane when weather conditions are constantly favorable, for it doesn't—so far as speed is concerned. But to hold her pace in any ordinary sea, a boat must have sufficient length to bridge the gaps, for you can't drive a short flat plane beyond a certain rate in very choppy water without something letting go besides the crew.

This matter of "seaworthiness" has almost as much to do with the dependability of a boat as does the power plant itself. In fact the lack of it is frequently the cause of the failure of

Mona is a great little boat. Of the Thornycroft type, she rides on her forward plane, her small after one merely supporting, and rudder and strut serving to maintain the trim.

In the deciding race the 20-foot Baby Reliance II and the 32-foot Ankle Deep were both considerably ahead of Maple Leaf until the last lap when both met with misfortune.

the engine. It's not the grind alone that puts motors, shafts and struts out of business. Often it is the smashing and warping they receive from the impact of the hull with choppy seas, for there's little compromise to a solid chunk of water at 40 miles an hour.

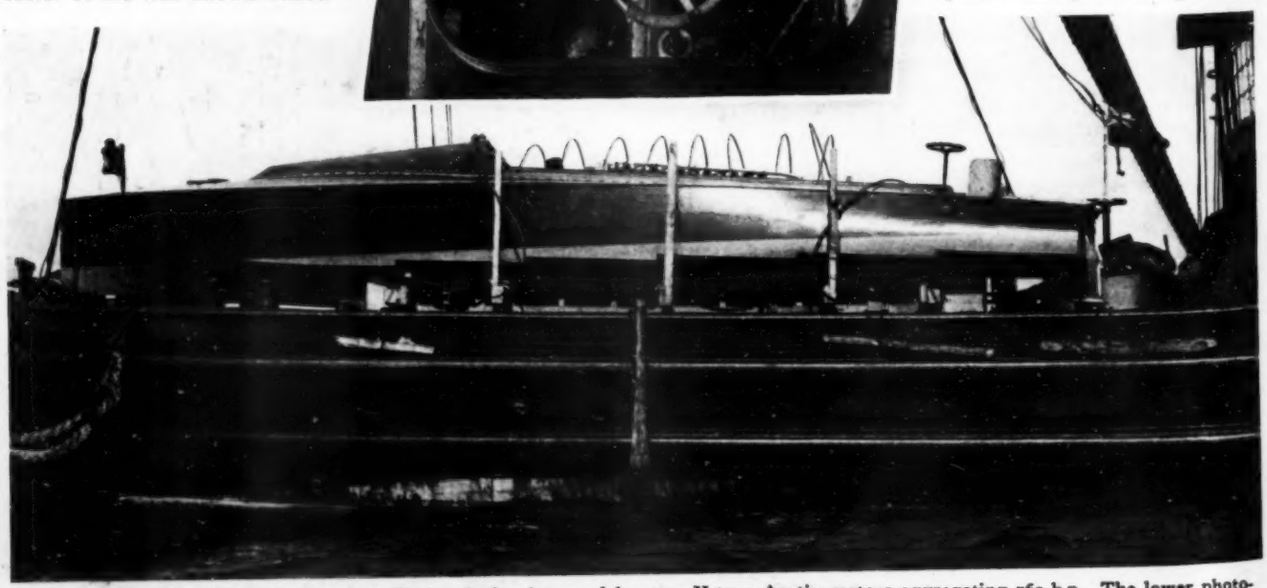
Then, too, imagine yourself a carbureter trying to produce a mixture under such conditions.

If we are after speed alone, let us demonstrate it on a course where the water is absolutely protected and not merely take a sporting chance that the conditions will be favorable; and then let us build our boats accordingly. To-day our 20-footers can beat the world under such conditions, including the French whose Richochets and Despujols boats proved the speed of the flat single stepper several years before we knew what a hydroplane was on this side of the water. But if we are to race in ordinary every day weather such as prevailed in Huntington Bay and such as probably will be encountered when we go over to the other side next year, then let us have bigger boats, 32 and 40-footers.

The fact that Baby Reliance II and Ankle Deep Went to the bad during the third race under ideal racing conditions and with an excellent lead over Maple Leaf, was an unfortunate coincidence without much significance except that had the weather been bad, their chances would have been less.

The challengers are excellent boats, both of them, built in that finished manner that is characteristic of English craft. Mackay Edgar's Maple Leaf IV is a 40-footer of the well known Fauber type built by Saunders of Cowes. She is powered with two V-type Austin motors aggregating 760 horsepower and is constructed in the peculiar Saunders method, her three-ply mahogany planking being sewn together and to the frames with copper wire. The photographs on this page give a comprehensive idea of the boat and her power plant, which is beautifully installed and runs muffled in the English fashion. Maple Leaf was driven by Tom Sopwith, the aviator, and had it not been for a rather clumsy repair job on her rudder, the four inch shaft of which caused considerable resistance, she would doubtless have made somewhat better speed.

Mona, the Marquis of Angelsey's challenger, was handled by her designer, Montague Batting. She is a 26-footer of the Thornycroft type with a single shallow step amidships and is tapered off to a fine, almost pointed stern. She runs on her forward V-shaped plane, the small after one merely carrying the rudder and strut and serving to preserve the trim when at speed, like the tail of an aeroplane. This little boat is powered with a 120 h.p. Wolesey engine and while not nearly so fast as her team mate, is a beautiful and consistent performer. There seems to be no critical point at which the little boat climbs out and starts to plane. She just rises gradually



Maple Leaf IV, Mackay Edgar's 40-foot Fauber hydroplane and her two V-type Austin motors aggregating 760 h.p. The lower photograph clearly shows the five steps in her underbody.

Baby Reliance III, the third member of the American team, cutting close to the outer buoy in the last race of the series.

preserving the same trim until at maximum speed. She is easily driven astern due to her fine after body and shallow step and she may be maneuvered with utmost ease, as shown in the accompanying photograph.

She is an excellent type for all round service in almost any weather.

After a week of "trials" that left no one convinced as to the personnel of the American team, Ankle Deep, Count Mankowski's 32-foot Dixie Jr., Commodore Blackton's 20-foot Baby Reliance II and Mrs. Blackton's 26-foot Baby Reliance III were named as the defenders.

Because of heavy weather, few of the boats had actually made the course during the trials and all had experienced more or less trouble. Those who had followed the rather spasmodic performances of the candidates, however, rather expected that Peter Pan V would be the third member of the team instead of Baby III, for after the thorough overhauling she had undergone during the first of the week her performance had been very creditable and in consequence, when the decision was announced at the last minute, there was much surprise throughout the fleet.

The First Race.

HUNDREDS of yachts and boats of all types were gathered within the triangle of the course to witness the first race on Saturday, August 31st. At the request of Mr. Edgar, the start was postponed half an hour to allow Maple Leaf's mechanician time to get her engines tuned up, but at 2.25 the preparatory gun was fired.

At the crack of the starting gun Mona was first over the line, followed closely by Ankle Deep, Baby Reliance II and Baby Reliance III, in the order named. Maple Leaf was having trouble and it was not until Baby II, who had quickly taken the lead, was turning into the stretch on her second time around that she finally got under way 23 minutes and 39 seconds late. One of her clutches had refused to take hold until given an heroic treatment of nails.

Both Ankle Deep and Baby III went to the bad shortly after completing the first round, but both boats finally got under way and finished at slow speed in order to be eligible for the second race.

Baby II completed the four rounds of the course in 48 minutes and 39 seconds, at the average rate of 37.11 knots or 42.68 statute miles an hour, thereby winning the first race.

Maple Leaf and Mona ran consistently throughout the race, averaging 42.5 and 36.6 statute miles an hour respectively.

The Second Race.

LABOR DAY found Huntington Bay in the grip of a north-easter and consequently the second race was postponed until Tuesday when the conditions were slightly more favorable. Promptly at 2 o'clock the start was announced and Ankle Deep shot over the line 19 seconds later, followed closely by Baby III and Maple Leaf running in her usual quiet fashion—scarcely audible save for the singing of her transmission, and throwing her characteristic cataract of spray. Baby II was three minutes late in starting and Mona

(*Continued on page* 61)

Mona, designed and driven by Montague Batting for the Marquis of Anglesey. The lower photograph shows her turning at full speed in a radius but little greater than her own length.

How the Internationals Were Run.

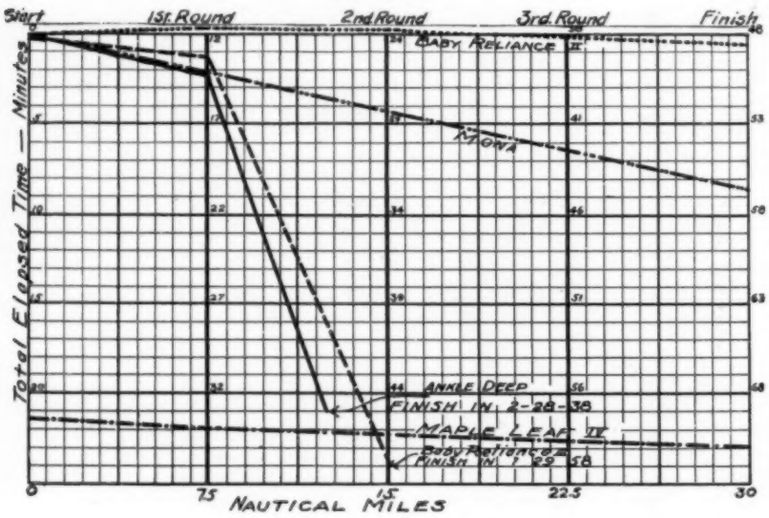
Key.

MAPLE LEAF IV ——·——·——
MONA ——··——··——
ANKLE DEEP ————————
BABY RELIANCE II ----------
BABY RELIANCE III ——— ——— ———

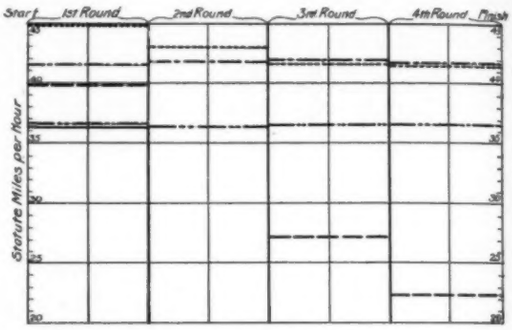
The "curves" on this page show graphically how the races for the Harmsworth trophy were run and they show this much more comprehensively than is possible with any amount of description. The curves to the left are plotted with times and laps as the co-ordinates and not only show the relative positions of the boats throughout the race, but their times of finishing each lap. Those on the right show the average rate in statute miles per hour of each boat for each lap and are an interesting comparison of the consistency of the running of the various boats. Besides these are given tables of the actual times per lap for all three races.—Editor.

First Race. (Won by Baby Reliance II.)

The Relative Positions of the Boats and the Times of Completing Each Lap.



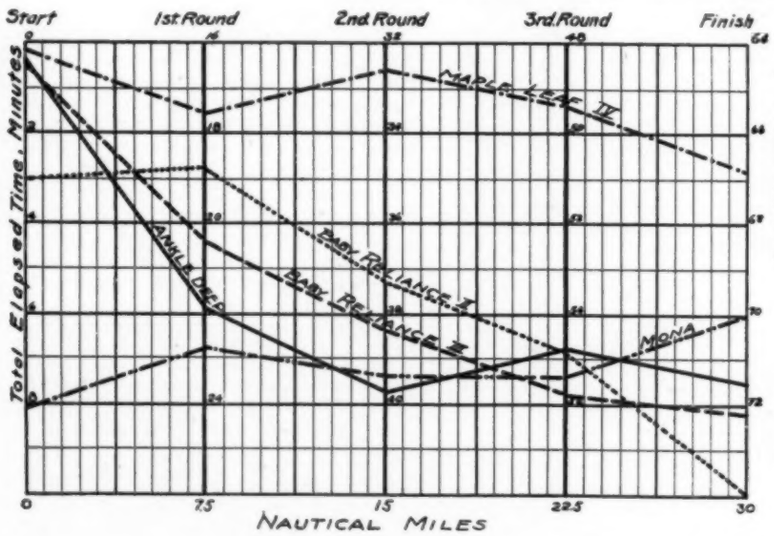
The Rate of Speed in Statute Miles per Hour of Each Boat for Each Lap.

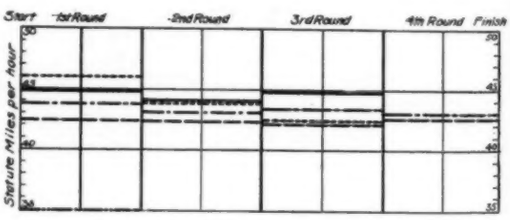


FIRST DAY.

	1st Lap	2nd Lap	3rd Lap	4th Lap	Total
Maple Leaf IV	12-27	12-22	12-19	12-24	0-49-32
Mona	14-08	14-12	14-07	14-09	0-56-36
Ankle Deep	14-13	54-09	40-44	39-28	2-28-34
Baby Reliance II	11-33	12-01	12-26	12-29	0-48-39
Baby Reliance III	13-02	34-40	18-57	23-05	1-29-44

Second Race. (Won by Maple Leaf IV.)

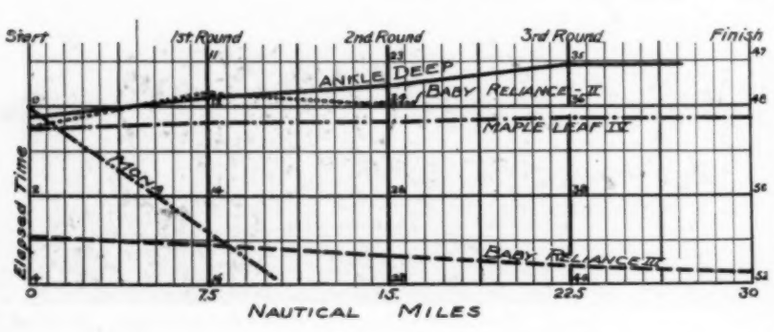


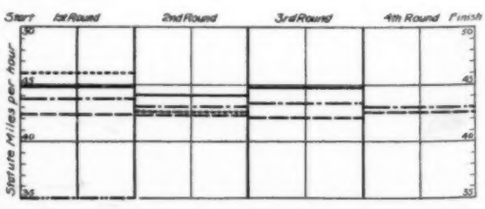


SECOND DAY

Maple Leaf IV	17-10	14-59	16-48	17-28	1-06-25
Mona	15-42	15-36	15-46	14-43	1-01-47
Ankle Deep	21-34	17-51	15-02	16-43	1-11-09
Baby Reliance II	15-46	18-29	17-45	18-53	1-11-13
Baby Reliance III	20-25	17-42	17-21	16-20	1-11-48

Third Race. (Won by Maple Leaf IV.)





THIRD DAY

Maple Leaf IV	11-51	12-00	11-55	12-00	0-47-46
Mona	14-47	19-21	Disabled		
Ankle Deep	11-34	11-44	11-34	Disabled	
Baby Reliance II	11-15	12-12		Disabled	
Baby Reliance III	12-13	12-14	12-16	12-08	0-48-51

The Elimination Trials.

The Week of Trials and Tribulations—the Exceedingly Interesting Collection of Boats of all Types and Some of the Things that Were Learned by Their Performances.

By Chas. F. Chapman.

Photographs by Edwin Levick, M. Rosenfeld, and the writer.

Saracen, a monoplane of the Adolph Apel type, is equipped with surface propellers which create a great disturbance when getting under way, but are as efficient as the submerged type at speed.

Photograph by Rosenfeld.

TO be at Huntington on Long Island Sound during the week of August 26-31, was an education. Never before in the history of motor boating had such a collection of speed boats been brought together, although the majority of these had practically never been in the water for a try-out and several of them had not even been heard of before they put in their appearance at the beginning of the week, so closely had the secret of their existence been guarded. No motor boat show could be compared to this exhibition of craft and besides they were all there for business and for one solid week both day and night, the scene was a wonderful one at the Atkin Wheeler yard.

Not unlike a country circus with the eleven contestants for the American International Team as the main show and with the crews of machinists, ignition men, photographers, agents, reporters, naval architects and even presidents, to say nothing of the hundreds of wise men camped out at various corners of the background, as the enticing side shows, we found a scene of activity, second to none, even though it is presidential year and on Long Island, too. It was a great sight.

The absence of hard times was not evident on land alone (though the would-be-contenders were in their cradles far above the high water mark about 95 per cent. of the time) for anchored along the shores of Halesite harbor every vender who had any wares to exhibit was there for his bit of free advertising and with samples galore for distribution to the few lay ones who were fortunate enough to be on hand before the finals were called.

Everyone was in a happy frame of mind though, for when six or seven craft tried to occupy the same space at the same time by anchoring along that 6 foot wide stretch of good mooring ground adjacent to the Halesite channel and upon the turn of tide a spider's web of mooring lines came to the surface, not a harsh word was spoken by a soul, for everywhere on the horizon similar scenes were visible and rich to the natives must have been the harvest of lost "hooks" after the transients moved on.

Of course the candidates for the American team were the big attraction. There were eleven of them under the watchful eyes of Messrs. Atkin & Wheeler, at the head of navigation in the little harbor. All but one of these were brand new boats with brand new engines. Of the latest type of B. I. T. possibilities—the midget 20 footers—there were 5, in the 26-foot family four were present while in the classes that heretofore have drawn every boat, viz.: the 32 and 40-footer, only one of each were present and the larger of these was the only one of last year's boats to try to win laurels again.

There were single screw racers, twin screw boats and those with triple screws. Of the engines some had 6, some 8 and others 16 cylinders per engine, although the 8-cylinder motor was by far the most popular. Altogether there were 156 cylinders capable of developing 2,650 H. P. But it is doubtful if more than 20 per cent. of them were ever in operation at one time. Seven of the eleven boats had single step underbodies while the other four were monoplanes. The number of hulls built of mahogany was only one or two more than those who preferred cedar for their craft while all but four were finished in the natural wood. Of these four, three were pot-lead color and one lone boat, Baby Reliance III appropriately named the "white hope," was the only one of this distinguishing color. The tendency was to place the helmsman in the extreme aftermost part of the boat and of this type there were nine out of eleven. In the other two, both known as the Dixie Jr. type of hydroplanes, the helmsman sat forward of the power plant and the engineer aft of it.

Photograph by Levick.

A striking photograph of Minnow completely out of water except for the tip of her forward plane and her propellers and rudder.

Baby Reliance IV is driven by two 8-cylinder Sterlings and is more heavily constructed than her sisters.

Poor old Restless was the only 40-footer on hand for the trials.

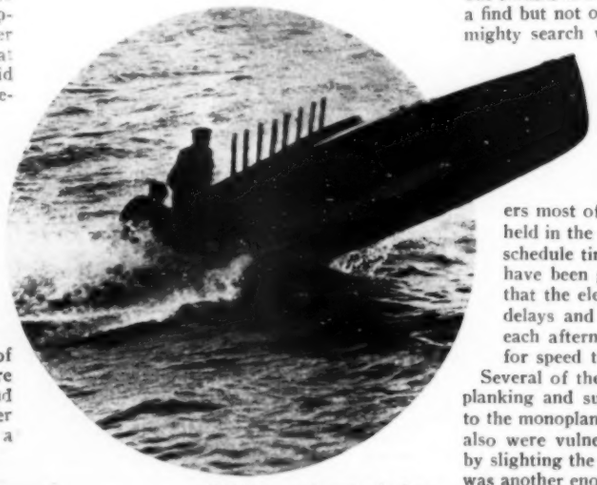
Another new feature of one boat was the surface propellers and while not altogether like that advocated by the inventor, Mr. Hickman, of Pictou, Nova Scotia, still the idea was there. This was the Saracen, a boat with two six-cylinder Parkin engines and at rest her propeller hubs were just below the waterline leaving the upper half of the wheel exposed. In diameter the wheels were not different from the ordinary ones, yet the width of the blades was about 50 per cent. greater. Saracen had hard luck throughout all the week and did not have a chance to demonstrate what she could do under time but on several short sprints apparently travelled very fast. In getting under way she kicked up mountains of spray until at speed and her wheels obtained hold of solid water when one could not distinguish her peculiarity even at close range.

The hulls of three of the candidates, Ankle Deep, Minnow and Peter Pan V, were equipped with side planes as well as single steps and those of the latter boat were monstrous affairs, having a width of nearly half that of the hull proper. A ⅞ inch pine plank formed the base with sheet copper as the sides of the pontoon-like planes, which had they been made air tight, would have been sufficient to keep the boat afloat in case of accident. As it was the after end of the pontoons were fitted with drains and as the racer got under way she assumed a position many degrees from the horizontal until the pontoons cleared of water. A very good idea of Peter Pan's construction may be seen from the photographs below.

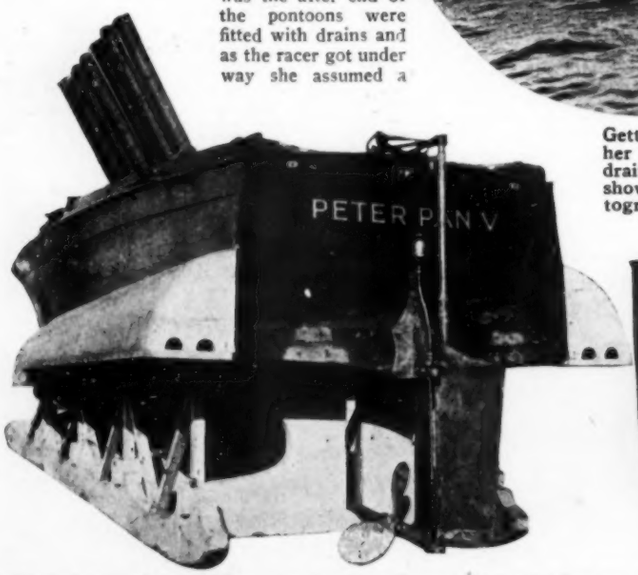
The elimination races themselves for the purpose of picking a team of three boats to represent this country in the finals were no less than a joke. They were supposed to be over the same course and for the same distance as that for the international races. They were scheduled for the afternoons of the first three days of the week but hardly once during the whole week did a boat go the whole distance without meeting trouble and those that went a single round of 7½ nautical miles at full speed, were very few and far between. Little attempt was made to have the trials in competition and the boats went around singly, as few laps as they chose and started at times that suited their fancy best. Even the committee did not know some of the boats by sight and when the little "Ran," a last year's displacement boat, came out on Wesnesday afternoon and went around the course three times without trouble at full speed, they thought they had a find but not one knew who the boat was. A mighty search was started to locate the mysterious craft which in reality was an old boat and only a second rater at the best.

The waters of Huntington Bay with its 20-mile sweep northward toward the Connecticut shores was hostile to the little 20-footers most of the time. Had the trials been held in the morning or somewhere near on schedule time (2 P. M.) conditions would have been generally ideal but it appeared that the elements became impatient at the delays and sought their revenge, for late each afternoon the waters were hardly fit for speed tests.

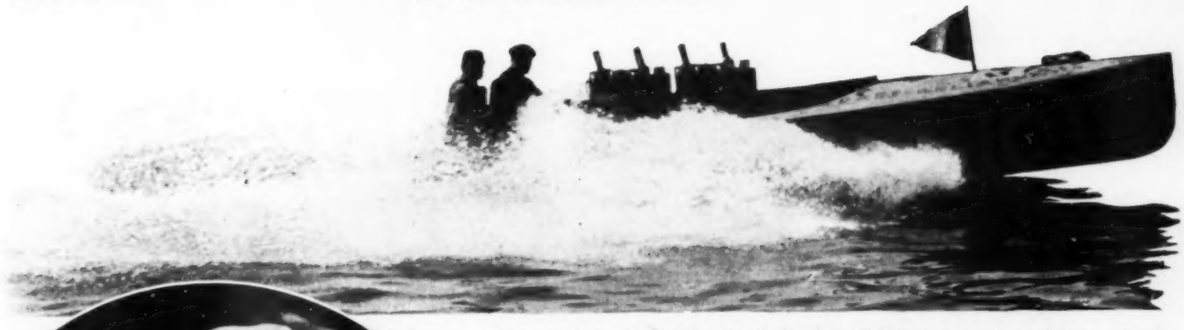
Several of the boats suffered from fractured planking and such defects were not restricted to the monoplanes alone for the single steppers also were vulnerable. Trying to save weight by slighting the diameter of the propeller shaft was another enormous mistake, for no less than five of the wee ones were towed home during the week with broken propeller shafts and as we learned later this



Getting under way before her "bustles" had time to drain. These are clearly shown in the lower photographs.



Many expected that Peter Pan V, the fast 20-footer designed by George Crouch and built for James Simpson by the Reliance Motor Boat Company, would be chosen as one of the American team. She is equipped with an 8-cylinder Van Blerck and her performance in the trials was excellent.



Baby Reliance II holds the distinction of being the only 20-footer ever to have raced for the Harmsworth trophy.

Photograph by American Press Association.

Mrs. J. Stuart Blackton, owner of Baby Reliance III, and Commodore Blackton, owner of Baby Reliance II, watching the performance of their boats during the International Races. The Commodore is doing more for the sport than any other one man in America.

defect probably lost us the cup.

Only one racer had the misfortune to go to the bottom during the trials and this happened to Ace III on the first day on the outermost leg where the water was the roughest. No damage was done to anyone, the boat simply overturned while at full speed, threw out her crew and gracefully sank. Foresight of the possibility of such an accident had led her crew to make a line with a float attached fast to her hull so her resting place in 50 feet of water was automatically marked and the boat raised the next day with little difficulty.

What might have proved to be a similar accident was luckily prevented when Panther Cub the 20-footer owned by L. V. Harkness and powered with three eight-cylinder Antoinette engines, ran too near the shoals in the inner harbor during her first trial. Her crew of two sitting way aft were catapulated overboard like a flash and the little one started off without helmsman or engineer like Heloise did at Hamilton earlier in the season, but the rescue of the runaway this time was less difficult. The boat went around in a circle of about 60 feet in diameter to port at a high speed listing well inboard and threatened vengeance to any in her path. The writer happened to be watching the trials from his cruiser at the time and was directly alongside the Cub where the accident happened. In his dinghy he picked up one of the crew and edging into the center of the circular path of the racer, he was able to back his tender close enough, after a few trials to enable the rescued one to leap aboard the hydroplane as she dashed past, after that all was easy as throwing off the switch did the rest.

The first trial was scheduled for 2 P. M. on Monday and at that time the conditions were as ideal as anyone would want them but the committee decided to postpone the start for one hour. About the time the preparatory signal was set at 2.55 a strong south wind sprang up and soon the bay was a mass of whitecaps but luckily it was only a squall and soon the wind dropped off entirely leaving only a slight ground swell. At the starting gun Minnow, the 26-footer owned by W. E. Dodge, was the only one that could get her engines going and she crossed the line 10 seconds late. Presently Ace III, Ankle Deep and Baby Reliance II came straggling across in a somewhat listless fashion and all four boats had spasms of stopping before the first mile was covered. Baby Reliance II led the bunch within a minute after the start, notwithstanding the fact that she was the last over the line. The first turning buoy was about 2 miles north of the starting line and was indicated by a mark, photographs of which will be seen at the bottom of the contents' page. These were visible for only a short distance and as the leading boat failed to find the mark she kept going in a northerly direction for miles out into the sound with the other three boats following her. The Connecticut shore came into view so the helmsman fearing something was wrong, put about and returned to the Committee boat, having consumed from 30 to 33 minutes for what should have been a 7½ mile round. The boats were then allowed to run around the course singly and during the afternoon Ankle Deep and Baby Reliance II managed to go around three times each, the best time of the former being 14 minutes, the latter 12-25. Ace III went around twice, her best time being 14-19. On the third round Ace III sank, although at this time there was practically no wind and only a long ground swell from the squall of the early afternoon.

Peter Pan V, the 20-footer owned by James Simpson and the 40-foot Restless II owned by T. F. Chesborough, made several futile attempts to start but each was unsuccessful as trouble was experienced just before the line was reached.

On Tuesday there was a fresh northwester blowing up the bay which necessitated calling off all events. Saracen went out and tried her luck but hastily put back into more sheltered waters.

On Wednesday afternoon it was again rough although the morning had been ideal. Racers were skimming all over the bay everywhere except on the course where there was a great scarcity of them. Baby Reliance III, the new 26-footer owned by Mrs. Blackton, made her debut and made four laps, her best time being

(*Continued on page* 61.)

Count Mankowski, the owner and driver of Ankle Deep, and the Countess, who is also a keen enthusiast.

Ankle Deep, the 32-footer designed by Clinton H. Crane, built by the Staten Island Shipbuilding Company and powered with two 150 h.p. Sterlings, was the first boat to be chosen of the American team.

Monte Penedo~The Newest Motor Ship

A New Liner of 6500 Tons Displacement Propelled by Sulzer-Diesel Engines of the Two-Stroke Type, for the New York-Rio Service.

By J. Rendell Wilson.

Special representative of MoToR BoatinG at the trials.

It is scarcely necessary to dwell upon the significance of the appearance of the motor ship of which class Monte Penedo is the latest to be launched. The advantage of the Diesel type engine has been proved beyond a doubt by the consistent and economical operation of the ships already built and now with each new boat there is brought out some new feature or refinement. Monte Penedo is the first large vessel to be equipped with two-stroke engines, and this feature is but one of a number of interesting ones described by Mr. Wilson in this article.—Editor.

HAS the steamship seen its best and most prosperous days? One can hardly answer otherwise than yes, when such a concern as the Hamburg-South American Line place their confidence in motor power by ordering a vessel of 6,500 tons dead-weight, the trials of which were successfully held recently at Hamburg. The little gasoline motor-boat has been growing larger every year and has now become a great leviathan, ships up to 15,000 tons D.W.C. now actually being under construction, and nearly completed. Seeing that a few years ago there was hardly anything afloat that one could term a motor-ship, it is only reasonable to assume that another five years will see a motor Campania, if not an Olympic engaged in the New York-England service. There are already a large number of big passenger and cargo motor craft building, and there is little doubt Trans-Atlantic liners would also be under construction, were it not for the fact that manufacturers of these Diesel engines find it impossible to accept such contracts owing to the number of motor-craft they already have on hand. For instance Messrs. Burmeister & Wain, builders of Selandia & Christian X and their engines, have nine motor vessels building and one steamship. This speaks for itself.

Monte Penedo, the new motor-ship for the Hamburg South American Co. has just been built at the Howaldsuerke Yard at Kiel, and engined by Messrs. Sulzer Bros., of Winterthur, Switzerland. She is of special interest as she is the first large vessel to be driven with two-stroke type Diesel machinery, and thus has high-power at her disposal without excessive weight. By the time this appears in print she will probably have arrived at Rio, or even New York Harbor. Her length is 350 feet, by 50 feet beam, with 27 feet moulded depth, and she is a twin-screw vessel.

All the deck hoisting machinery is operated by electricity.

By the adoption of oil engines in place of steam machinery, about ten firemen are dispensed with; thus a saving here alone of 3,500 dollars a year is effected. There is a saving in the machinery weights of about 250 tons, as steam engines and boilers of similar B. H.P. would weigh 400 tons as against Monte Penedo's 150 tons. The Sulzer engines occupy so little room that nearly 10,000 cubic feet of space is saved, so that an additional 700 tons of cargo can be carried. But owing to the fact that weight for weight with coal only one-fourth the oil-fuel need be carried, another 200 tons of cargo-space is gained, thus bringing the total gain of cargo carrying capacity up to 900 tons. So the advantages of motor-power will be apparent. On trials, when running light, Monte Penedo attained a speed of 13½ knots, but her loaded working speed will be fully 10½ knots.

Her motors are installed well aft.

Monte Penedo is a real ship.

The machinery installation consists of twin Sulzer-Diesel engines for the propulsion of the ship and two smaller auxiliary Sulzer-Diesel engines, directly coupled to a dynamo and a compressor respectively. Both the main engines are of the four-cylinder single-acting type, working on the two-stroke principle, and at 160 r.p.m. give 850 b.h.p. or a total of 1,700 b.h.p. (Cylinder diameter 470 mm., stroke 680 mm.) The bedplates are cast in three parts and are of similar design to that of the marine steam engine.

Naturally the cylinder covers are connected direct to the bedplates through steel columns so that the explosive stresses are transmitted direct to the bedplate, leaving the body of the cylinders free from axial tensile stresses. This is very important where two-cycle engines are concerned, as the scavenging takes place through openings in the cylinder walls. In addition to the vertical steel columns cast iron columns are provided to take the transverse stresses and to provide guide surfaces for the crosshead shoes.

The crossheads are provided with single-type guide shoes working on plates bolted to the columns and the shoes are lined on their "head and astern" surfaces with white metal;

the guide plates are adjustable and water-cooled. Planished steel plate doors enclose the engines, through which there is ample space for inspection and overhaul. Forced lubrication is provided for all working parts, the oil being cooled and filtered before being used a second time. A pump is fitted for the cylinder lubrication the oil first passing through a sight-feed.

A most important and interesting feature is that the working pistons are water-cooled, and the water,—led through telescopic pipes without stuffing boxes,—enters the piston head in the form of a free jet. All main cranks are set at 90°, but the scavenging pump crank is set at an angle relative to the working cranks to give the best balance. The scavenging pumps are arranged on the forward ends of the crankshafts and are controlled by a piston valve driven from the crankshaft through Stephenson's link motion.

With regard to the compressors, these are of the three-stage type. The first stage serves as the crosshead of the scavenging pump and the remaining two stages are driven from the crosshead through a patented system of balance-levers. All three stages are water-cooled. Intermediate coolers are also provided, so that throughout the whole process of compression the air can be kept down to a suitable temperature. The compressor pumps are provided with automatic valves so that no special reversing gear is required.

Scavenging air enters the cylinders through two horizontal rows of ports in the cylinder walls; the lower row is controlled by the piston alone, while the upper row is controlled by the scavenging valves and eventually covered by the piston. By means of this upper row air to any desired quantity may be introduced into the cylinder after the piston has closed the ordinary scavenging openings. The exhaust openings are arranged on the opposite side also in the cylinder walls. The exhaust gases enter a water-cooled exhaust pipe leading to a silencer from which they escape freely into the atmosphere. This method of scavenging gives not only excellent results in working, but from the point of view of simplicity of design and safety is a decided advance on other existing methods, for should a scavenging valve fail it is impossible for a charge to escape into the exhaust pipe. The cylinder covers are very materially simplified and free from the otherwise customary multiplicity of valves and gear, for in consequence of this design there remain only the fuel and starting valves to be mounted on the covers. At the same time the reversing gear is also simplified and thereby easy to operate.

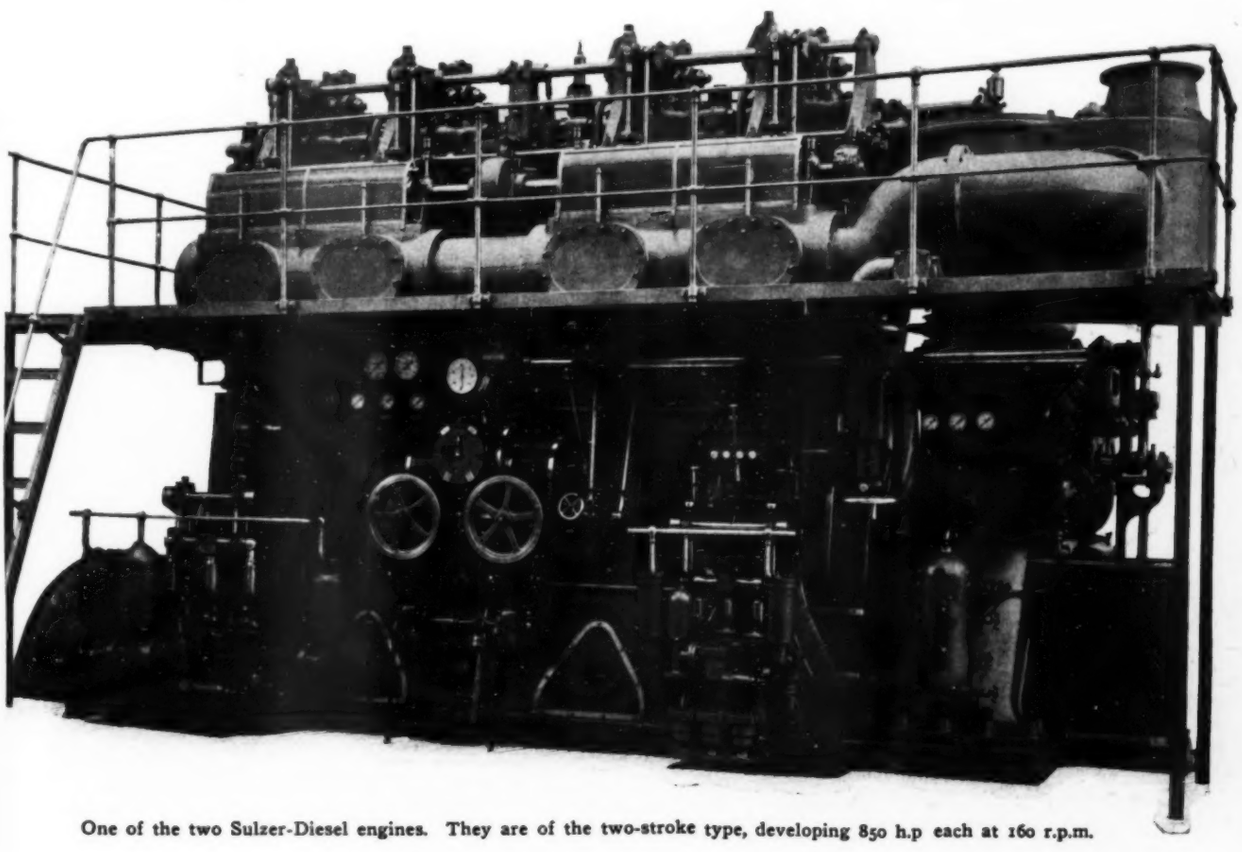
The contrast of the past and future.

The manoeuvring gear consists of two mechanisms, each driven by a little compressed-air engine through a worm-drive. One engine serves to rotate the camshaft through the desired angle relative to the crankshaft and to put over the scavenging pump connecting rods into the required position for ahead and astern running; the other serves to operate the fuel and starting air valve gear for starting, running or stop. Manoeuvring may also be done by hand gear so that, should the manoeuvring-engines fail through any cause whatsoever, no time may be lost in carrying out the orders from the bridge.

As may be seen from the drawings and photographs, these manoeuvring engines are placed central on the front of the main engines and so near to one another that if need be one engineer can control both main engines. A governor is fitted, which on the slightest increase above the maximum speed operates direct on the fuel-pump, and cuts off the fuel.

The pumps for the various services are driven by means of balance-levers from the crossheads of both No. 1 and No. 4 cylinders and are constructed on the customary ship design. They supply cooling water for the working cylinders, pistons, compressor cylinders and inter-coolers, etc., and are connected for sanitary and bilge purposes. It must however be understood that the sanitary and bilge pumps were designed to be driven off the main engines at the special request of the ship owners, and in consequence, the main engines appear somewhat complicated. A compressed air turning engine is mounted at the back of each main engine and drives through teeth machined on the periphery of the flywheel which latter may be seen in the photographs.

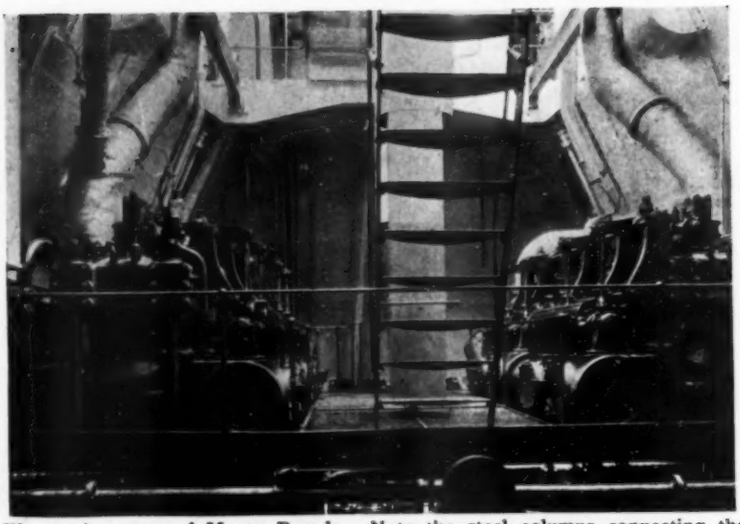
We now come to the auxiliary machinery which consist of two three-cylinder single-acting Sulzer-Diesel motors of 205 mm. bore by 220 mm. stroke (8.07" x 8.66" stroke) work-



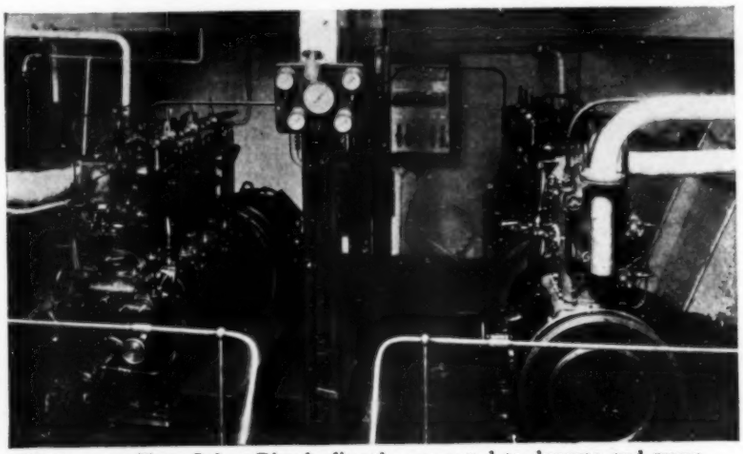
One of the two Sulzer-Diesel engines. They are of the two-stroke type, developing 850 h.p each at 160 r.p.m.

ing on the four-stroke principle. Both are of 50 b.h.p. at their normal revolutions of 425 p.m. One is coupled direct to a dynamo, which serves for lighting the ship, the other drives a compressor for use in case of emergency or failure of the ordinary air supply, but especially for use when entering or leaving a port, canal or in similar circumstances when large quantities of air are required for manoeuvring. The dynamo and its engine weigh 7 tons. The engine frames are built in two parts and of box form, strengthened internally by columns, while the engines themselves are enclosed by light planished steel plates easily dismountable for inspection or overhaul. On the cylinder heads the fuel, starting, admission and exhaust valves are mounted, and are operated through vertical rods by cams mounted on a horizontal shaft enclosed in the engine frame. This cam shaft is driven from the crankshaft through spur gearing. The valves and valve gear are similar to the usual stationary four-stroke motor design. The fuel pump is driven direct by the crankshaft.

An adjustable governor is fitted which works on the well known principle of controlling the amount of lift of the suction valves of the fuel pump. An oil pump for cylinder lubrication is cast in one with the fuel pump, the drive being common to both. Forced lubrication is provided for all bearings and gudgeon pins by a pump placed inside the engine frame and which draws through a filter. The oil level can be read off a conveniently placed gauge. On the forward end of the auxiliary engines a semi-rotary wing pump which is coupled to the crank-shaft supplies water for cylinder and compressor cooling.



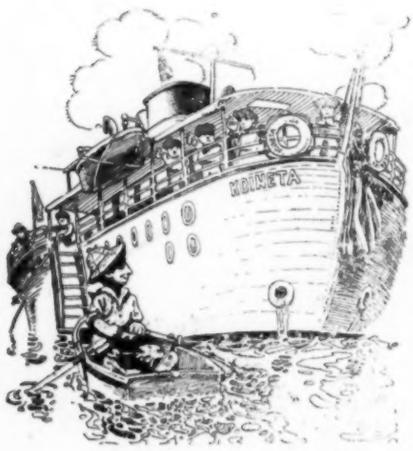
The engine-room of Monte Penedo. Note the steel columns connecting the cylinder heads directly with the bed-plates.



The two auxiliary Sulzer-Diesels directly connected to dynamo and pump.

The net weight of each main engine is 55 tons, or with all pipes, air flasks, exhaust, silencer, etc., 77 tons, whilst the air compressor and its driving motor weigh 6 tons, a total of 160 tons. The fuel consumption of each engine was proved on a 48 hours' run at normal working to be 210 grammes per b.h.p. hour, but as the pumps for the various ship purposes are driven off the main engines, the actual consumption is much lower, so the vessel will be very economical to work.

It will be seen by a glance at the profile of the boat at the head of this article that the machinery is installed well aft, occupying the least desirable space and leaving an exceptionally large space for the storage of cargo. The boat is controlled from the bridge amidships and there are two masts with derricks for loading and unloading the cargo.



The Modest Boatman.

By Berton Braley.

Drawings by
William Harnden Foster.

A motor boat is my desire,
Two hundred tons—or three,
Say thirty knots, her speed—not higher,
That's quite enough for me;
A boat that I myself might run,
Save for a mate or two,
An engineer—a first-class one,
A skipper and a crew.

The cabins need not be too rich
(Teak wood is excellent),
A music room, a smoking niche
Would make me quite content;
Perhaps a steward for each guest,
To stand behind his chair,
To bring the drinks he may request
And serve the homely fare.

With such a pleasant little boat,
So simple, fore and aft,
I'd let my wealthy rivals gloat
Upon their lordly craft;
And in my modest, quiet style
I'd sail the mighty sea
In frugal comfort for awhile
The simple life for me!

The Racing on the Niagara River

The starting point off the lower end of Motor Island.

The view of Baby II most familiar to her adversaries.

The Remarkably Successful Series of Races for the E. R. Thomas and Chamber of Commerce Trophies, the Annual Event of the Motor Boat Club of Buffalo.

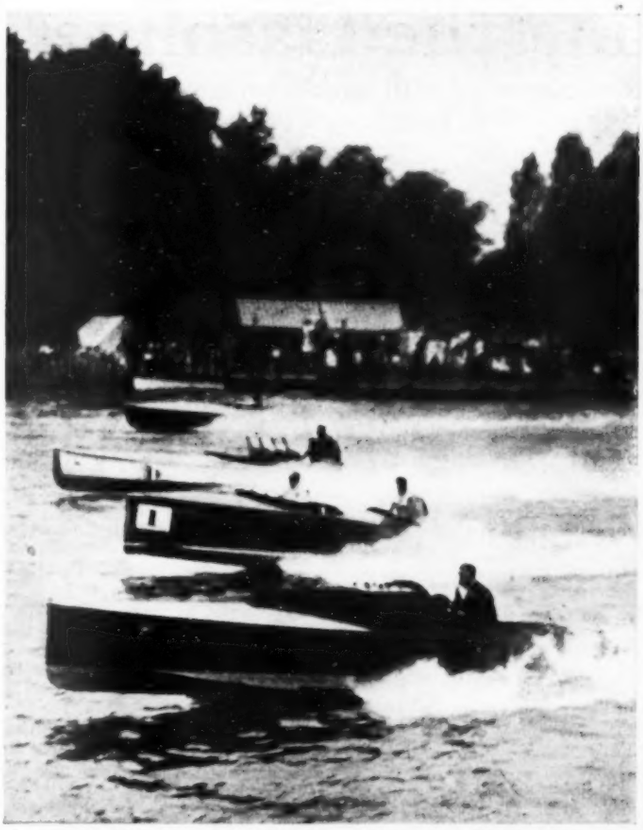
By Chas. F. Chapman.

Photographs by Edwin Levick and John G. Robinson.

ON the Niagara River, some 5 miles below the city of Buffalo, at a point where the river is nearly a mile wide, there is a small island located directly in the center of the stream. This island, although comparatively small, is not so trifling after all, for being about 2,000 feet in length by 800 feet wide, and containing over 14 acres of the finest land is the home of the Motor Boat Club of Buffalo. "Motor Island" as they have appropriately named it, is their exclusive property, and as far as an ideal spot is concerned for all their wants and requirements one would have to look the world over for one surpassing it.

Motor Island, originally only a small, low, marshy bit of land, almost totally submerged, has been developed entirely by the Club, principally through the efforts of its commodores, both past and present, Messrs. Criqui, Dold, Vars and Gunnell. That by an enterprising and progressive membership whose organization and constitution are a model fit for any, they have succeeded in building up the island so that it is one of the beauty spots and most attractive points of the city of Buffalo. To do this, it was necessary to use an enormous amount of fill which was obtained by dredging the Niagara River in that vicinity and covering the surface of the island with a covering loam. All of the work was under the supervision of a landscape gardner, and now its shade trees, shrubbery, flower gardens and graded walks are of an order high enough to make any club proud. Deep water extends entirely around the island, and on two opposite sides bulkheads have been constructed enabling motor boats of almost any size to tie up sufficiently protected from the winds from any direction.

The club house itself, while perhaps not as large as a few of those of the eastern yacht clubs, still it was planned and built for use and compares most favorably with that of any motor boat club in America. It is their second house, the first having been burned in 1909, a few days after the club moved in, thus severely handicapping them from many standpoints but from which they have entirely recovered. However, the policy of the club is still a progressive one, and they have planned at present for further enlarging the size of the island and building a large number of boat houses to shelter the craft of their members. An ample number of tennis courts and shooting traps provide recreation for members of the rocking chair fleet.



A remarkable picture of the start of the International Inter-Lake Championship for the E. R. Thomas Trophy.

As to the ability of the Motor Boat Club of Buffalo being able to arrange and successfully carry through to completion a successful race meet of large proportions, no one can doubt. The Regatta Committee, backed by the various subordinate committees and, best of all, the entire membership of the club and racing boat owners at large, started out to pull off a most successful meet, one which would make records that would go down to history as great advances is speed and development in design of engine and hull, and in this they were successful to a marked degree. Commodore Wm. J. Gunnell, with such able assistants as Ex-Commodore C. A. Criqui and Fleet Captain Harold Kelley, fairly lived on the job for the entire three days of the meet, and not one word of complaint at their management was heard. It was mainly through their efforts, dating back for some 6 or 8 weeks, that such an affair was possible but while considerable credit should go to them, yet there seemed to be almost a countless number of others that were lending a hand tending towards success.

The visiting crews were entertained in grand style. Oh, how different from the way things are done at many other meets we have seen this year. Accommodations were provided for the care of the racing craft, and should any owner be desirous of hauling his boat out at any time, the necessary apparatus was at hand. Something was doing at the club house every minute, and from the trend of the informal remarks, made at a dinner given them by Commodore Gunnell, the attitude assumed by the members and guests toward the Motor Boat Club's efforts and results were shown.

(*Continued on page 37*)

THE PRIZE CONTEST IN QUESTIONS AND ANSWERS

A STUDY of the lessons taught by many of the Ocean Races this year, brings out several striking weaknesses in many of the boats' equipment. The most marked and serious of these is, perhaps, that developed in the gasoline tank installation of many of the larger and apparently most seaworthy craft. This does not apply either to those particular plants alone which were installed by amateurs or under amateur supervision. If the tank shifts and breaks off the pipe connection to the engine the boat becomes hopelessly at the mercy of the waves, to say nothing of the danger due to fire and suffocation from the fuel that runs into the bilge. Neither can the damage be repaired or even the fault located in many installations we have seen especially where the pipe line is in some inaccessible position of the boat or connected in such a way as to make a test impossible.

WHILE the danger is great if the tanks are improperly installed yet such fear in every craft is unnecessary also, with the proper precautions. If the proper attention is given to details at the time the boat is built or her power installed no one need have the slightest cause for worry from this source. Gasoline in large amounts is heavy and a tank full of it is a hard body to start in motion or suddenly bring to a condition of rest. The result is as obvious as the cure should be. By all means do not neglect your tank supports, in any direction, top, bottom, sideways as well as fore and aft, and have your pipe line get-atable, for the cleanest fuel is likely to contain sediment before it is used.

THE QUESTIONS FOR THE DECEMBER CONTEST ARE THESE:

1. What do you consider the best all round dinghy for the small cruiser? Give dimensions and method of construction with sketches or photographs.

Suggested by C. S. T., Deep River, Conn.

2, Describe with sketches or photographs the most desirable form of steering gear outfit for a raised deck cruiser, giving particular attention to reliability.

Suggested by Allan O. Goold, Portland, Me.

3. What are the difficulties in using kerosene as a fuel for the ordinary gasoline motor, and how can these be overcome for operating on the former kind of fuel?

Suggested by Frank C. Parker, Norristown, Pa.

ANSWERS to these questions addressed to the Editor of MoToR BoatingG, 381 Fourth Ave., New York, must be: (*a*) In our hands on or before October 25, (*b*) about 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of October.

THE PRIZES ARE:

For each of the best answers to the questions above, *any* article advertised in MoToR BoatinG, of which the advertised price does not exceed $25, or a credit of $25 on *any article* advertised in MoToR BoatinG, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on *any article* advertised in MoToR BoatinG, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

When You Send in Your Answers, state what you will take if you win a prize.

Installing the Gasoline Tanks.

Various Positions Recommended with the Structural Advantages of Several Different Methods of Support.

THE PRIZE CONTEST—Answers to the First Question in the August Issue.

Amidship and Made Fast to the Ribs.

Prize Won: Hardware from Durkee.

ONE thing is certain—gasoline is heavy. One small cruiser, a twenty-five footer with a ten horse-power motor used 97 gallons of gasoline in the New York to Albany and return race. This represents a fuel weight of over 530 pounds. This of course varies from a maximum to zero when the tank is empty. No such variable weight should be carried either in the bow or the stern. This means that the place for the tank is amidship and by far the best plan is to use two tanks, one on each side and as far apart as possible, to increase the period of roll of the boat.

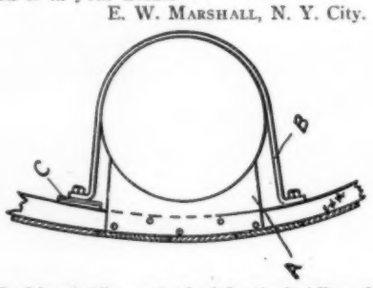
The tanks should be cylindrical in form for several reasons, chief of which is their structural strength. A good quality of galvanized iron or steel is preferable to copper for the same reason.

The tanks should rest on two wooden cradle-blocks, such as A in the accompanying sketch, placed apart a distance about equal to half the length of the tank. These can be directly affixed to the ribs of the boat. Over or near each block is a band strip B lag-screwed to the ribs. These should be slightly shorter than necessary to reach from the rib around the tank and back to the same rib and shimmed up as at C with washers or thin strips of wood. Enough of these shims may be removed to insure a tight squeeze of the tank between the cradle blocks and the band. By all means block the ends of each tank so that it cannot possibly move longitudinally, even if you run head-on into a dock.

The piping may be seamless copper tubing or ¼" (or larger) brass pipe, bent to fit and as free from joints as possible. Make up all threaded joints with shellac, not with lead or any composition containing oil. Include a good separator or at least a removable screen in the pipe line from each tank and as near the tank as convenient. It is also wise to have a cut-off valve at the tank end and also at the carbureter end of each pipe.

Why should you use a drip pan under the tank? You don't insulate your storage battery by placing it in a glass tray, do you? Better have a tight gasoline installation which is as safe in your boat as a tight gas installation is in your house.

E. W. MARSHALL, N. Y. City.

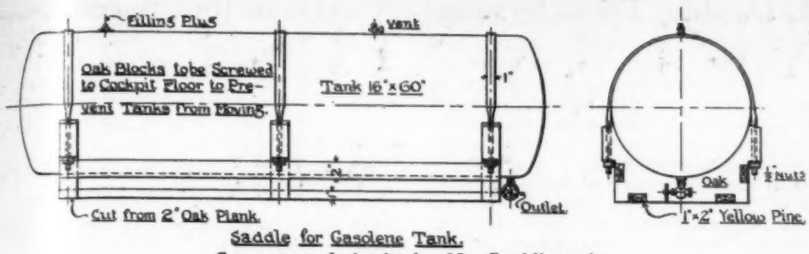


Mr. Marshall's method of firmly holding the tank.

Beneath Seats in Self-Bailing Cockpit.

PROBABLY the most important problem in the fitting out of any power craft is the safe installation of its gasoline storage equipment. And even more important than the safeguarding of the gasoline supply in an open boat is that of insuring safety from leaky tanks or piping below decks in the cabin cruiser where ventilation is obviously more difficult. In many cases it is possible to keep the tank or tanks entirely above the deck, the most desirable place for them being undoubtedly in the self-bailing cockpit, where they may be installed under side seats without encroaching upon its seating capacity. In this style of installation the least possible chance of any leakage reaching the boat's bilge is allowed, the only piping below being the short length of feed piping necessary to reach from the cabin bulkhead to the carbureter. In case of leakage from the tanks, the gasoline finds its way into the sea through the cockpit scuppers and the explosive vapor arising from it is rendered harmless by the admixture of plenty of fresh air. It is also possible to detect the presence of a leak promptly, as the gasoline on the cockpit floor can be easily seen or smelt and the leak remedied before the loss of fuel ecomes excessive.

The tanks should be preferably of cylindrical form, this shape being naturally the strongest, and should be provided with several



Saddle for Gasolene Tank.

Supports and chocks for Mr. Goold's tank.

swash plates or partial partitions to prevent the straining of the tanks in a heavy seaway. Tin-lined copper of heavy gauge or the newer seamless steel construction will be found satisfactory.

The tanks will be set in half saddles of oak sawed to fit from two inch plank and are held in place by encircling straps of brass or galvanized iron terminating at the lower ends in threaded bolt-ends with nuts which may be set up from underneath at will, thus holding the tank down firmly in its place. End and side motion should be guarded against by oak blocks properly placed and securely screwed to the floor of the cockpit. The saddles should be braced and built into a solid structure by longitudinal strips of yellow pine 1 in. x 2 in. as indicated in the sketch, so that tilting or displacement of the saddles would be impossible and the tank and framework together could be easily moved out into the cockpit for inspection or repairs.

The fuel outlet should be at the after end of the tank since when running all boats settle aft to a greater or less degree and a forward outlet would probably prevent the last few gallons of fuel in the lower end from being drawn from the tank. A filling plug should, of course, be placed on top of each tank, its exact location being governed only by the owner's idea of convenience. No complicated filling pipe is necessary in a cockpit installation, since it may be easily seen when the tank is full and a slight overflow would not be of any consequence. A good sized screw deck plate should be set in the cockpit seat over the filling plug. The air vent should be a brass pet-cock screwed into the filling plug or a small flange elsewhere on top of the tank if preferred. A shut-off valve should be placed in the supply pipe close to each tank and a brass cross-over pipe may be fitted to connect the two tanks, the branch from each tank entering a tee from which a single drawn copper tube leads to the engine. Or entirely separate pipes may be led to the carbureter and the tanks thus be kept absolutely independent of one another. The importance of an efficient gasoline filter in the feed pipe line cannot be over estimated, and no fuel pipe smaller than one-quarter inch should be considered. All feed piping should be protected from possible injury but should be as far as possible, subject to easy inspection.

The installation above outlined is probably the safest in use and possesses scarcely any disadvantages. It lends itself particularly well to the regular construction of the modern raised deck cruiser of small size, in which a self-bailing cockpit is usually specified, and calls for no expensive special construction in the way of outer tanks connected outboard and providing a circulation of sea water around the fuel tanks with the resulting difficult pipe connections and similar complicated features.

ALLAN O. GOOLD, Portland, Maine.

Tanks Should Be Placed Aft.

IN the average small cruiser of to-day aft is the best place for the gasoline tank. A full tank forward in a heavy sea might make things uncomfortable and the bow can always be loaded down if desirable. Assuming that the tank is of the ordinary round variety, riveted and galvanized, there will be no need of a drip pan and overboard drain. These tanks are made for gasoline or air and will stand a good pressure without leaking.

If the boat is heavily constructed having good solid deck beams, the tank may be advantageously suspended from these and a brace put across under if necessary.

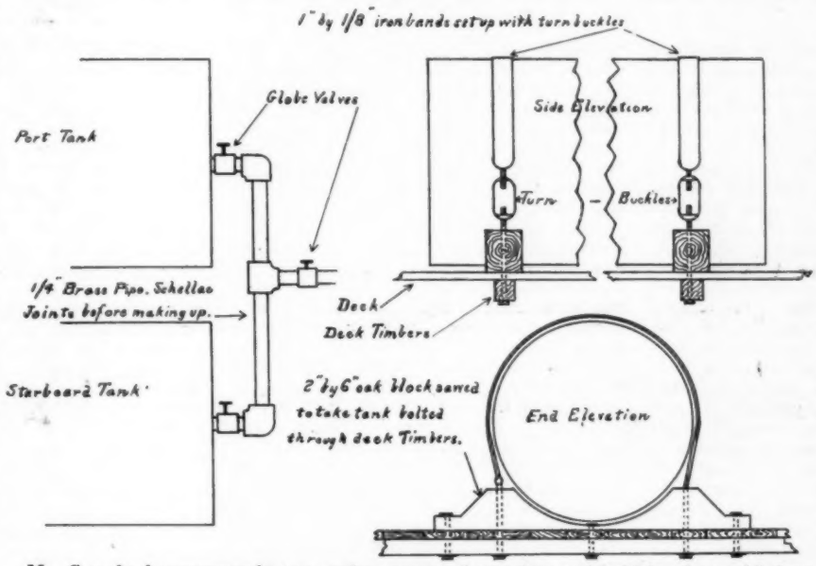
Fasten the tank with two iron straps; under which put a strip of leather to make them grip tightly. The leather also allows for a mistake in making the straps which might easily occur in bending. Strap iron can be bent cold, if a sharp angle is not attempted. Bend over a round corner. Drill two holes in each side of the band and fasten with lag screws or large wood screws. Draw the band down hard on the tank and put blocks on the upper side to help hold in position.

If suspending the tank is objectionable, put in cross timbers and set the tank on those. The method of fastening is the same. The tank can be placed fore and aft or athwart. The latter would require slightly more material, for fastening the bands to.

Use a filler cap or deck plate tapped the same size as the opening in the tank. Connect with a nipple so that no gasoline can be spilled into the boat. Any overflow will run on the deck and is easily washed overboard. There should be a shut-off as near the tank as possible. If no opening for a vent is provided, drill and tap the nipple to the deck plate and fit a ¼" air cock. These very likely come in an unhandy place, so lead rods from them to some place near the engine. Use not smaller than ⅜ O.D. (¼ inside diameter) annealed copper tubing and make up all joints with shellac.

A tank securely installed in this way cannot shift and cause leaks or broken joints and there is no chance for loose gasoline inside the boat except from the carbureter, which should be provided with a drip pan.

W. B. MOORES, Newburgh, N. Y.

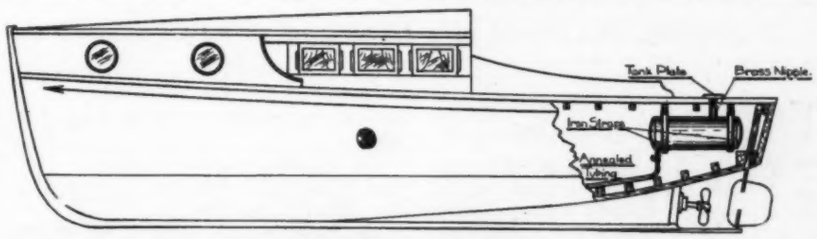


Mr. Crawford recommends two tanks connected together and held in place with iron bands set up with turnbuckles.

Hangs Tanks from Cockpit Seats.

AFTER much experimenting the following method of installing tanks was used on my 28-foot cruiser and has proved very satisfactory. The boat is of the raised deck type, cockpit about eight feet long and six wide. Two 20-gallon galvanized hot water boilers are used for fuel, being installed under seats on each side of after end of cockpit.

Instead of being braced up from the floor these tanks are hung from the seats, allowing for a galvanized iron drip pan underneath to cover the whole tank space and absolutely preventing any leaking fuel from getting anywhere but in the pan. The supporting straps are made from heavy steel rods, and iron or steel plates which should be drilled and tapped for heavy machine screws. In my case the rods were ⅜" diameter and the plates ½" thick and 3" wide. If the straps should be hung directly from the wooden seat and tightened up, the seat would be bent up in the middle and broken; the iron plates prevent this and are very essential. They are fastened



TANK INSTALLATION
FOR
SMALL CRUISER

Mr. Moore's tank located aft and suspended from the deck beams.

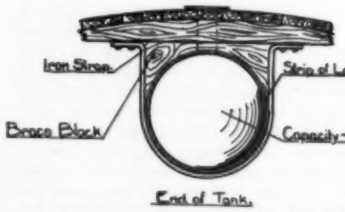
up under the seats by large brass machine screws put in above as shown. The straps can be tightened by screwing up the two screws shown in the diagram. Unless the tank is very long two straps are sufficient and when used in conjunction with two or three oak saddles to prevent the tank moving sideways, a very rigid construction is obtained. With the straps properly tightened up and saddles securely screwed to seat it will be impossible for tanks to shift with the motion of the boat.

The drip pans can easily be made of galvanized iron; turn the edges up about one inch and solder corners. A flap can be left on the inside to turn up back of tank as shown. In the lowest corner of the drip pans solder a lead or copper pipe and carry it out through the hull above the water line to carry off any leakage. Of course, it will be necessary to have the tanks above the water line to have the pans scuppered overboard, but in a cruiser with a raised water tight cockpit this is easily done.

I fitted a long swinging door in front of these tanks made of T & G stock and by opening this the whole tank is accessible. The regular side opening on the tank was used as a fuel outlet, thus bringing the longitudinal seam on top. A small vent was made of a piece of quarter inch pipe screwed into a hole tapped to fit the pipe in the top of the tank, a ⅛" plug was fitted into the tapped end of the ¼" pipe, almost flush with the seat top. This ⅛" plug has a very small vent hole bored through it; but when filling tank the plug must be removed to allow air to escape.

A brass filling plate was set into each corner of the after deck and piped to tanks as shown; this prevents spilling gasoline in the cockpit, and makes it difficult for anyone to siphon off your gasoline, on account of elbow in pipe. The two extra openings in each tank were fitted with pipe plugs set into shellac; use shellac for all tank and piping joints. If possible the gasoline fuel pipes should be accessible for their whole lengths. If each one is run separately to carbureter with shut-off valves at tanks and carburetor the engine can be run on one tank, keeping the other in reserve.

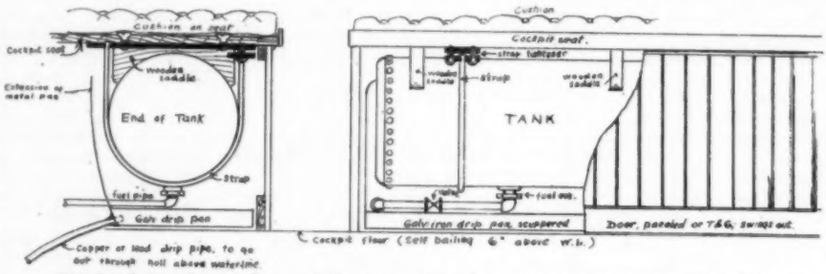
H. H. PARKER, Oakland, Cal.



Mr. Moore's method of fastening his tank.

A Double Tank System.

ASSUMING that safety, security, and positive gravity feed, constitute the principal items in the installation of the fuel system there is probably no better method than to install two tanks one under each seat in the cock-pit. This system offers many advantages especially in boats of the smaller class. First the fact that they are installed out in the air where should a leak occur the gasoline will have more chance to evaporate instead of running down in the bilges filling them with highly explosive gases, and also are in a position where they may be examined if necessary without removing anything. On a small cruiser two tanks will also be an advantage from the fact that their capacity can be made greater than one large tank thus extending the cruising radius. Another point in their favor is that being stowed well aft, a better distributing the weight is obtained as it is a well known fact that a boat with all of her ballast forward and aft will pitch and dive more than one where the weight is evenly divided. Last but not least is the shortening of the piping leading to the engine. This is where probably ninety per cent of the gasoline leaks occur, not because it is improperly installed, but because this long stretch of piping is usually led to the engine through the lockers where it comes in contact with and is buffeted by everything in them owing to the vibration of the boat when running.



Tanks hung from the cockpit seat with drip pans beneath, suggested by Mr. Parker.

The sketch shows a plan of installing a two tank system piped up so that either tank may be shut off if desired or the fuel may be fed from both at the same time. The tanks set on chocks fashioned from a piece of two by six inch oak which are securely bolted through the deck timbers and are held in place by iron bands running around them from each side of the chocks and set up with turnbuckles. Secured this way they are free from any chance of working or coming adrift while the boat is in a seaway.

At first glance this installation may seem rather intricate but a close examination proves that a plant so installed will give the user the self satisfaction of knowing that no matter how hard his craft may labor in a gale his fuel system is sure to stay intact regardless of how she rolls or pitches.

E. W. CRAWFORD, Newark, N. J.

A Gasoline Barrel.

THE tank about to be described is a little unusual but we have found it gives excellent results in our 28-foot cruiser. It is a galvanized iron barrel such as a number of the leading oil companies sell gasoline in, holding about sixty gallons, which should be enough to keep the average small cruiser moving all day.

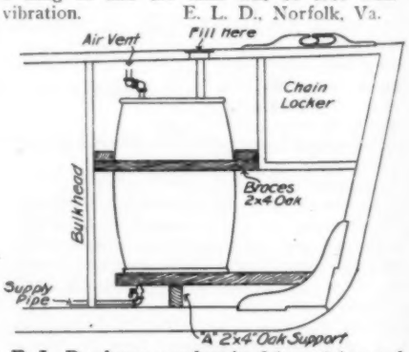
All seams are welded, and absolutely tight (doing away with the necessity of a drip pan). There are two holes in the top, an air vent and filling hole. The feed hole to engine will have to be drilled and tapped.

The barrel will fit very nicely in the eyes of a small raised deck cruiser, leaving space directly forward for a chain locker. Our engine being well aft, a nice balance is kept.

To hold the tank in position, a short piece of two by four oak is fastened to the keel, this should come directly under the center of the barrel. This piece (marked "A"), will vary in length in accordance with the lines of the boat, anywhere from six to twelve inches. Over this is built a platform for the barrel to rest on ("B").

The frame around the barrel is next, it also should be of two by four oak, and cut in round a little where it meets the barrel. Two pieces are bolted to the side of the boat (G & D) and the piece forward (E) bolted to them. Then the barrel fitted in. The piece aft (F) coming last. These pieces are placed with the two inch faces to the boat and barrel, to give the maximum degree of stiffness, the four corners are bolted with five inch galvanized iron bolts. The two side pieces fastened to the sides of the boat, if possible through a rib. Two bolts on each side are sufficient. Of course, this frame must come above the bilges in the barrel, about eight inches from the top. A little care will insure a snug fit and the tank will be free from vibration.

E. L. D., Norfolk, Va.



E. L. D. places a galvanized barrel forward to hold his fuel.

Rebabbitting a Worn Bearing.

Increasing the Power of a Used Engine by Overhauling and Refitting the Bearings.

THE PRIZE CONTEST—Answers to the Second Question in the August Issue.

TO babbitt a worn or burned out bearing, first remove the old metal and clean out the anchor holes.

If it is one of the main crank shaft bearings, the shaft can be used to babbitt on. A piece of smooth paper should be wrapped about the journal and stuck fast with a little shellac. Make the joint in the paper come at one side where the box is divided. Babbitt will run much smoother on paper than on the cold shaft.

Make some cardboard washers to close up box at each end. Place these on shaft at each end of journal.

Recommends a Jig.

Prize Won: Bull Dog Reverse Gear from Kennedy Machine Company.

Now place the shaft in lower half of box or bed plate, holding it in position with a small wooden V block under the outer ends of the shaft. Line up the shaft with the planed surface of bed plate, unsing a surface gauge if one is at hand. If only one bearing is to be habbitted, the others will assist in lining up the shaft. Raise it slightly to allow for scraping the new bearing.

Put the liners in place and have one of thin sheet metal extend through to the shaft so as to divide the babbitt. In this liner cut some small notches in the edge next to shaft, for the babbitt to run through, for we are going to pour both halves at once.

You are now ready to place the cap or upper part of crank case in position. Fasten down with the bolts and then with some clay or

putty, "mud up" the ends of box so as to hold the cardboard washers in place and make all tight so no babbitt can run out. Shove a knife blade between the washer and cap at each end, so as to form a vent.

The babbitt is now ready to pour and the best place for pouring is through a ½ or ⅝" hole in the top of cap. A ring of clay should be placed around the hole to make pouring easier. If there is no hole in cap you may pour from one end by making a sort of funnel with the clay so the metal will run in.

Melt the babbitt in a clean iron ladle. Heat until it will scorch a soft pine stick. Pour the metal quite fast so it will run well and fill the box before cooling.

Remove the caps, take the shaft out and scrape bearing, using some lamp black or red lead and oil on the shaft to mark the high places. Scrape these off until you have a good fit on the shaft.

The bearing on lower end of connecting rod would need to be handled in a different way. It is very important to have the hole in this bearing perfectly in line with the pin in upper end of rod. If the crank pin was used to babbitt on, it would be quite difficult to place the rod so these two bearings would be in line. Therefore I would advise using a simple jig which I will illustrate below.

The upper end of rod fits snugly on the small pin and the babbitting is done on the large one, which should be the size of crank pin. Have one liner extend through on each side so as to divide the metal at the joint.

Pour from the open end which is up, using some clay around the lower end to keep the metal from running out.

C. H. C., Saginaw, Mich.

An Easy Method.

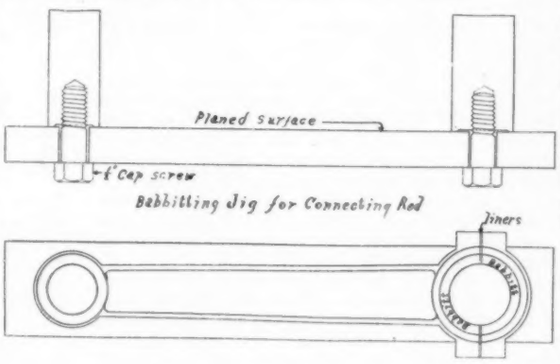
SUPPOSING the main bearings of an engine were burned or badly worn, one should take the engine apart to first examine the crank shaft for any sign of wear and irregularities which must be removed. Perhaps it has not worn so badly but can be smoothed up again with a dead smooth file to a piece of fine emery cloth. The best way is to put it in the lathe and true it up. After this has been done, a mandrel of iron should be turned the same size as the bearings on the crank shaft, leaving spots on same mandrel, a tight fit for the connecting rod. Having now finished this much, start on the engine to cut the old babbitt out and clean thoroughly where there are any signs of oil or moisture. By fastening the connecting rod tightly to the babbitting mandrel and truing up same as sketch, one can be sure that the bearing will be in line when finished. Make some rings out of cardboard, a tight fit on the mandrel, these will stop the babbitt from running away. A cake of soap pounded with a hammer will make a good putty and it is pressed all around the cardboard and along the casting to keep the hot metal in. Now get a good ladle and some babbitt (most of the old babbitt can be put in the pot), and melt over a *steady* fire. By having a clean dry stick and occasionally putting it into the metal, the temperature for pouring can be found, as soon as the wood scorches. Always skim the babbit before pouring, and never put anything wet or damp into the ladle or one is apt to lose his sight. As soon as the babbitt has cooled after pouring, remove the mandrel and file any surplus metal even with the casting.

Bolt the other half of the engine to the top of the crankcase after putting back the mandrel. Put paper liners between the two, for a preventative of the babbitt sticking and pour the other half. Take one of the paper liners out and then scrape the bearings to a jib. A little rosin mixed with the babbitt just before pouring will have good results in a clean casting. Always warm the mandrel and put a thin coat of oil on same.

W. H. COUSINS, Renfrew, Ont., Canada.

Extra Bearings Always on Hand.

AFTER dismantling the engine, I took the crank case and bearing caps to a machine shop and had them bored out in this manner: first the crank case was mounted on the lathe carriage and with the use of a surface gauge, was set so that the center of the bearing coincided with the lathe centers, a boring bar was then placed between the centers of the lathes and the bearing caps put on with a quarter inch liner between, after which the bearings were bored out, the ridge at the ends of the bearings which held the babbitt in position being bored away and just enough metal taken from the inside to leave a clean bearing. After this was finished I had them drill and tap a ⅜" hole in the center of each bearing and cap, into which I screwed a brass plug and then sawed it off to the thickness of the babbitt bushing. Next I got a piece of pipe ½" larger on the inside than the bored bearing and another piece ¼" smaller on the outside than the crankshaft which I set centrally into the larger one. The babbitt was then melted; while the babbitt was melting I took a gasoline torch and heated the pipes slightly so that the metal would not fly when poured. The metal, when hot, was poured into the mould formed by the two pipes which were about ½" longer than the bearings; of these I cast three, as my engine was a double cylinder. After the metal had set, the small pipe was driven out and a block of wood used to drive the rings of the metal from the larger pipe. These I took to the shop and had them bored to fit the crankshaft and turned to fit the bearing, and sawed in half; a hole was then drilled in the center of each half so that they would fit on the pins in the bearings and caps, this effectually keeps them in position. The oil holes are next marked and drilled and the grooves put in, which completes the job. All you have to do whenever you again have occasion to renew your bearings, is to cast a couple of rings of babbitt and have them bored, turned, split, a hole drilled in the center of each, and put them in position and your bearings are rebabbitted and you can never get your crankshaft out of line. A set of these bearings can always be carried on board.



Plan of jig suggested by C. H. C.

OTTO P. BOETTGER, Baltimore, Md.

Babbitting One Half of the Bearing at a Time.

A BABBITTED bearing to give the best results, should have an even, smooth, glassy surface, free from bubbles, specks of dirt and grit, and streaks of the dross or scum that forms on the top of the kettle of molten metal. All such things retard speed and cause more or less wear on the shaft, besides reducing the area of bearing surface of the metal used, especially is this true, in high speed, light weight engines, where weight and area are cut down to the very limit of safety.

Of little use, however, is a fine, smooth, true bearing, if pitted, rusty or worn shaft is to be run in the bearing. The shaft should be looked over, before rebabbitting is attempted, for the finest work spent on a babbitt bearing is lost if such a shaft is used.

Fine scratches on the shaft, caused by sand, etc., are often the cause of leaky compression in two cycle engines and by preventing the oil from spreading beyond the scratch are the cause of burned bearings.

Particles of old babbitt, oil and dirt, in the boxes are the cause of pounding and uneven wear, both of shaft and bearing, the babbitt being loose in the boxes is seldom thought of as the cause of the trouble. The only remedy is to rebabbitt.

So far, so good, and now for the method. First, I line up the shaft in the boxes. The empty boxes are bolted together by the usual bolts and have several shims or pieces of stiff paper between the two parts, the thin red-brown paper or board used in letter files and by bookbinders, is both smooth and durable, and answers the purpose very nicely.

The shaft is held in position by two pieces of hard wood about an inch larger than the ends of the box. Each piece has a hole through the center the same size as the shaft; these pieces are slipped on the shaft and placed in position, one at each end of the box; a couple of iron clamps hold the pieces of wood on the lower part of the box; with the light blows of a hammer the wooden blocks may be moved in any position and the shaft brought to an exact line. Care should be taken that the shaft does not bind in any of the other bearings. The upper half of the bearing box is now removed and the shaft between the two blocks is polished with graphite. The box and shaft are warmed with a blow torch and the metal is poured in. The babbitt metal should not be any hotter than is necessary to pour easily. The casting cools very quickly and the other half can now be made.

The upper half has had the oil holes plugged and is now placed in its usual position with shims in place. The bolts are tightened to bring the upper in the final position and with two more iron clamps the wooden blocks are clamped tight to the upper half box. The lower clamps are removed and the bolts taken out; when the shaft is raised the upper half box is firmly attached. The box is turned half way over and the shaft is supported on two boxes or chairs. The pouring is the same for the lower half.

The oil holes are cleaned out and all raw edges are trimmed clean.

While this entails the labor of completely taking down an engine to rebabbitt one bearing, the results are more than equal to the amount of work required, in silence and easy running.

Success may not be your reward at the first attempt, but the casting of two or three bearings will soon give you the knack, and it becomes easier with every trial.

MELVIN D. ANDREW, Canandaigua, N. Y.

Adjustment Is Important.

IT should be stated at the beginning, that the work of rebabbitting a bearing calls for mechanical skill of a high order. Work of this kind is generally beyond the average machinist, and few amateurs are capable of turning out a really good job. However, the best method for doing this work is to remove the old babbitt from the box, and mold the new babbitt in a ladle. "Magnolia" or any other brand of good anti-friction metal may be used. A spindle slightly smaller than the crankshaft should next be placed in position in the box and the ends of the box around the crankshaft smoothly plugged up with asbestos cement or fire clay. The box must now be heated with a gasoline torch, for it is important that the babbitt be cooled gradually when it is poured.

When the box is well heated, the melted babbitt is poured in, and when cooled the spindle may be removed. This leaves the babbitt in a rough, "spongy" shape. To make the babbitt more dense it should be lightly peaned, and this is always done in the best shops. The core thus made should be bored slightly smaller than the crankshaft diameter. To smooth up the bearing, smear a little Prussian blue (common blueing will answer) on the crankshaft, place in position and rotate it a few times. Remove the crankshaft and take off the "high spots" indicated by the color, by carefully scraping away the extra metal. Scraping must be done carefully and but a little should be removed at one time. By repeatedly trying the fit of the crankshaft, with the aid of the color, the shaft is made to fit the bearing evenly throughout the entire bearing. Curved steel bearing scrapers (which may be purchased at any tool shop) will help the amateur to turn out a better job.

Care and adjustment of a bearing is important, and while 1-16 of an inch side play is recommended, no shaft should be free enough in its bearing to appear loose. Hot and burned out bearings are caused by improper lubrication, grit working in, and also to bad fitting and tightly set up bushings. Bearings subjected to reciprocating action (as the connecting rod) must be kept well adjusted. Engine bearings are hard working parts, and ample lubrication is essential, and more oil should be supplied to new bearing surfaces.

Chas. S. Taylor, Deep River, Conn.

A True Shaft Is More Important Than a Good Bearing.

First procure some heavy cardboard, some light, smooth cardboard, a handful of stiff putty and, if possible, a blow torch. Remove the old babbit and thoroughly clean the iron surfaces. The bearing surface of the shaft should be brought to a high finish in a lathe with a fine broad face file. If the shaft is scored it should be first turned. If it simply needs polishing, the ends may be supported between nails on blocks and dressed with a fine file while being rapidly turned by a second person. In no case use emery or abrasive of any kind, and remember that upon the finish and truth of the shaft depends, to a great extent, its successful operation.

Cut two heavy pasteboard collars which will fit the shaft snugly. Wipe the shaft with an oily cloth, slip on a pasteboard collar and insert in the lower half of the bearing, blocking it up to its true running position. Make sure that the parting line of the bearing passes through the center of the shaft. This setting may be determined as follows: With a fine pointed pencil, draw a line on each side of the shaft at exactly the parting line of the bearing. Turn the shaft a half revolution and if the lines then jibe with the parting line of the bearing, the up and down position is correct.

Melt the babbit and heat until a dry stick will be discolored and caused to smoke. Heat the bearing and shaft until they are just too hot for the hand. If a blow torch is not handy, a red hot iron may be utilized. Slip the other pasteboard, collar on the shaft and press both collars up against the bearing. Place a piece of pasteboard up against the shaft on each side of the parting line, first cutting a hole in each, up near the shaft to receive the babbit. Hold them in position with weights and mold a wall of putty around each hole. Pour in the babbit until the space is full and rises up in the holes on each side of shaft.

After the babbit is set, slip back the collars and remove the shaft. Cut off the lugs even with the parting line and then replace the shaft.

Bearing caps are usually filled through a hole, of ample size, which is afterward drilled out for an oil hole. Cut two pieces of thin pasteboard and place against the shaft at the parting line as before. If the bearing is to be air tight, these must be very thin to avoid too much scraping in finishing. Heat the shaft and cap. Screw the cap down over the pasteboard pieces and slip the collars up as before. Pour the cap full and allow the babbit to set. Scrape the lower half very lightly with a bearing scraper. Scrape the cap until it bears evenly and not too tightly on the shaft when screwed down in position.

J. F. C., Providence, R. I.

Installing a High Tension Magneto.

Several Schemes of Wiring This Modern Piece of Apparatus for the Jump Spark System.

THE PRIZE CONTEST—Answers to the Third Question in the August Issue.

THE following is a simple high tension magneto and coil system, using but one set of plugs. Its thorough practibility has been demonstrated on one particular boat the writer has in mind, which has traveled no less than 10,000 miles. The cylinders of practically all engines have but one set of spark plugs and when installing a high tension magneto it is either necessary to do without battery and coils for starting, or go to considerable expense to have extra spark plug holes put in.

As will be observed by accompanying drawings, all that is required is a few extra feet of wire and a home made combination switch, which also replaces the regular switch, always necessary.

Drawings show a 2-cylinder outfit, but as many more cylinders may be taken care of as necessary by extending switchboard and adding switch units.

The switch board is built up with fibre board for the base and switching slide, ⅛" flat head brass bolts and nuts, No. 20 gauge sheet spring brass and small brass or copper rivets. (Rivets may be made out of No. 8 wire.) The fibre board can be cut and worked the same as wood and is a perfect non-conductor. Its position should be determined by arrangement of the boat, but on the average motor boat with hatch over engine the best place is directly under edge of side of hatch. Attach vertically with screws to side of hatch beam. Cover with sheet rubber "flappers" or curtains on both sides to guard against shocks or short circuit from water. Connect No. 8 gauge brass control rod from bulkhead to switching slide.

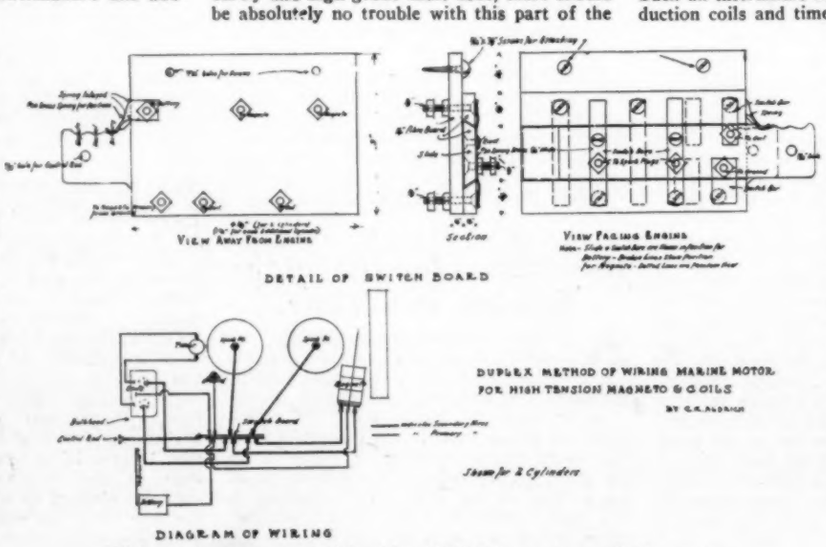
In case of an open boat place switch board in a tight wood box with holes in lower side for wires to enter and in end for control rod and make wide sides removable with two screws each. Make large enough so that wires will have free movement, as well as switching slide.

Diagram shows proper manner of connecting up the system. Location of various parts of the outfit, of course, are approximate. With the connections made neatly and securely and high grade cable used, there should be absolutely no trouble with this part of the outfit and it makes a good serviceable system at but a small per cent on the cost of the regular dual or duplex systems.

G. K. Aldrich, Sacramento, Cal.

But One Set of Plugs.

Prize Won: Rochester Steerer and Fixtures from the Mechanical Devices Co.



Wiring scheme suggested by Mr. Aldrich for a two-cylinder motor.

Several Methods.

By the term "high tension" as applied to the magneto, one understands an instrument for developing a low tension current, yet containing within its structure a secondary coil of fine wire, a condenser, and a timer, or in other words the combined mechanism for transforming the primary low voltage current to one of high voltage through the agency of its secondary windings, finally distributing the spark by means of the timer to the proper cylinder at the proper moment. Such an instrument at once dispenses with induction coils and timers with their faults and multiplicity of wires, but because of the exact conditions required for the best results, it must be geared to the crank or cam shaft, so that the rotative speed of the armature and timer shall be constant and bear a certain relation to the crank motion, dependent upon the type of motor. The magneto therefore becomes an integral part of the motor and the mounting of it is an undertaking for the manufacturer and is usually a trifle beyond the skill of the average amateur. Chain, belt or friction drive will end in failure. Magnetos used in connection with induction coils are not high ten-

sion within this meaning, nor have they, in reality, any occasion to develop more than six or eight volts, usually doing so at from 1500 to 2500 r.p.m. It is possible to have an armature so wound as to light 3 or 4 low candle power lamps in addition to developing current to fire the motor. We used such a one. (Hendrics on a 6 h.p. Globe.)

Provided coil and magneto are suited to each other, the result will be very satisfactory and the coil without further adjustment may be used interchangeably with the proper number of dry cells, without endangering it. In fact, a battery of primary cells should constitute a part of the ignition equipment on every boat. Magnetos slowly part with their magnetism and occasionally, without apparent reason, suddenly become inert and require remagnetizing.

With this type of magneto several methods of installation are possible, and those based upon personal experience will be mentioned. Both belt and friction drive were used. The first plan was carried out by securing under the cylinder head nuts ¼" plate of iron, and mounting the magneto thereon, driving the armature by means of a belt. Because of the accurate relation between the pulley faces no trouble was experienced with jumping of the belt. There was the occasional necessity for taking up slack. Altogether it was a very successful outfit and entirely out of danger. The next plan tried was mounting the magneto on the bulkhead directly above the fly wheel. A hinge was used for this purpose, and the weight of the magneto held it in good contact, and permitted swinging up when not in use thus preventing any possibility of flat spots on the friction wheel when at rest.

The third experience consisted in placing the magneto on the floor of an open boat. This proved to be positively idiotic. Rain leaking through the cover and bilge water ruined it in about 36 hours. After repairs I placed it on a block 6" above the floor, using a pin hinge at one end of the magneto base, securing it so as to raise the friction wheel end about one inch above level when it rested on the fly wheel. After covering it with a canopy of sheet lead I had no further trouble. By disconnecting the wires and withdrawing the pin, the magneto could be removed to a place of safety in a few moments. From personal experience I prefer the friction drive.

The following diagrams are for "A" make-and-break, "B" for jump spark ignition.

L. H. PRINCE, Philadelphia, Pa.

Position Most Important.

THE first thing to do is to secure a location. A magneto should not be mounted too close to the motor, because the current may jump from its terminals to metal on the motor. It should not be too close to the exhaust pipes, which might soften its vulcanized rubber; avoid a position where water might drop on it. Keep it as high above the base of the motor as is convenient and in a position where it may be positively driven by gears from the motor. It should be kept well out of the bilge because of the danger of sparks, which sometimes occur within the magneto, igniting the gasoline vapor.

Having selected a position we must now gear it properly. All high tension magnetos give two sparks for every revolution of the shaft. Determine the number of sparks needed by the engine for each crankshaft revolution and divide by two the number of sparks given by the magneto in one revolution. Thus a 6-cylinder 4-cycle engine requires three sparks for every revolution. Dividing by two shows us that the magneto must be driven one and one-half times crankshaft speed.

Before setting the magneto permanently we must "time" it.

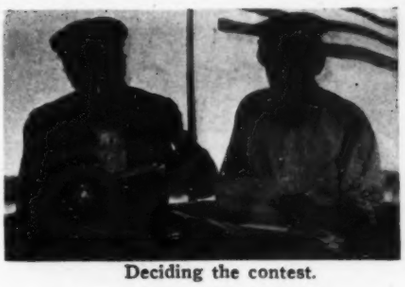
First, find out the firing order of the cylinders and carefully note it down. Most 4-cylinder 4-cycle engines fire in the 1-3-2-4 order.

Bring the piston of first cylinder up to firing point—about 5 per cent off center on up stroke.

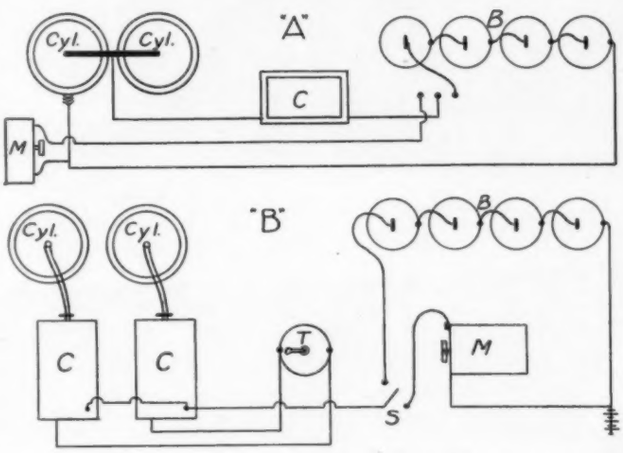
Now turn the armature of the magneto until circuit breaker "breaks;"—having left a part of the turn of the breaker for retard. With the magneto in this position (at break) and the motor at firing point, engage the two gears and set the magneto on its base.

Now turn to the distributor. Take the face off and see at which terminal the contact maker is and note the one. Replace the distributor and run a high tension cable from that terminal to the plug on first cylinder. Then run another cable from the terminal which the contact maker next touches to the plug on the cylinder next to be fired. Wire up all cylinders in a similar manner.

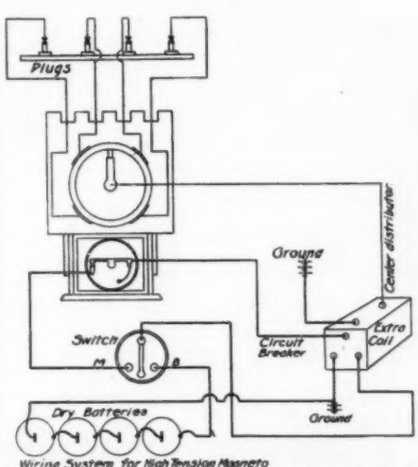
On the spark and throttle quadrant push the spark lever up about one-fifth of the quadrant's length and run a brass or a steel rod from it to the lug on the magneto circuit breaker, which had a part of a turn left for retard when we fastened it. Now wire the magneto up as per the diagrams. Remember in firing the circuit breaker, it must turn in the same direction as the magneto shaft to retard spark and opposite to advance.



Deciding the contest.



Dr. Prince's schemes for the make and break and jump spark systems.



Plan of Mr. Bittel's wiring.

The Paris Races.

THE annual motor boat meeting known as the "Coleurs de Paris" was held recently on the River Seine, just below the city of Paris, and attracted a record crowd of spectators. Sigma III, shown below, and well-known as one of the prominent performers at Monaco, won the free-for-all. The boat is of the "bass fiddle" type and is capable of great speed in protected water.

Sigma III, one of the prominent contestants in the races held recently on the Seine.

ELMASADA II

A 110-Foot Steel Motor Yacht for General Cruising Along the Atlantic Coast and in Florida Waters.

Elmasada II.

Length over-all	110 ft.
Beam, over-all	16 ft.
Draft	4 ft. 3 in.
Power Plant	Three 120 h.p. Sterlings
Cruising Speed	14 miles
Maximum Speed	17 miles
Gasoline Capacity	2400 gal.
Cruising Radius	1500 miles
Designer	Whittelsey & Whittelsey
Owner	Daniel Good, Buffalo, N. Y.

(For design see Dec., 1911, issue.)

ELMASADA II, a 110 ft. steel motor yacht designed by Whittelsey & Whittelsey of New York City for Mr. Daniel Good, of Buffalo, N. Y., was recently completed at the yards of Kyle & Purdy at City Island. She left the New York waters early in July for her home port on Lake Erie, via the outside route by way of Quebec and the St. Lawrence River. Although the yacht is of moderately light draft (4 ft. 3 in.) she proved herself an exceptionally able sea boat during the trip and maintained an average speed of 12 knots throughout her ocean run. A trimming tank aft, having a capacity of 750 gallons of water, increases her draft to 4 ft. 8 in., making her very steady in a seaway.

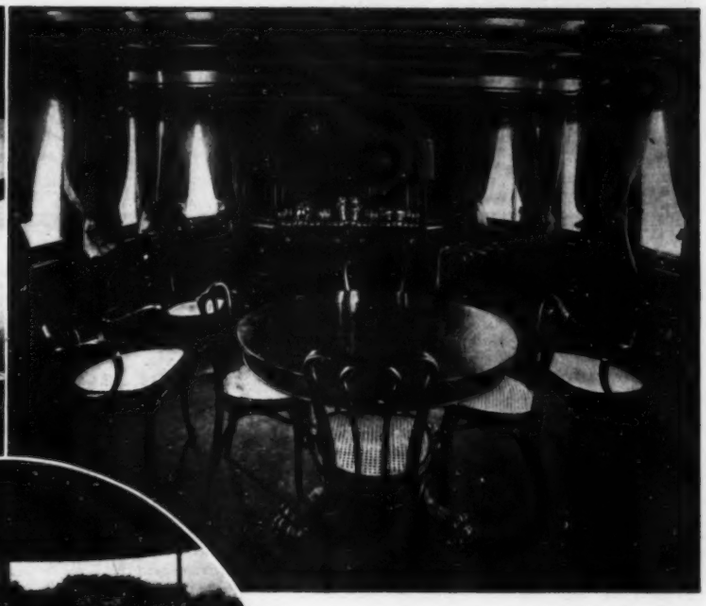
The yacht is of the raised deck type with a long center house, her hull being built of the highest grade steel with medium weight scantlings. The bridge is located on the forward end of the deck house and directly underneath this is the dining saloon with dumbwaiter to the galley which is just forward of and below the dining saloon. Next aft of the dining saloon the engine hatch is located which is steel sheathed, and entrance to which is from the port deck. (The after end of the cabin house, a saloon 22 ft. long, is located at the same level as the after deck.) The stairway to the sleeping quarters is from the after deckhouse and leads to the owner's double stateroom which is 14 ft. in length and extends to the after part of the boat. Adjoining this is a private bathroom, two double guest staterooms, two single guest staterooms, bath and washrooms. The finish is cream enamel with mahogany trim, doors, berth fronts and beam caps being also in mahogany. The bathrooms are finished in metal tile. The deck house and all joiner work is done in mahogany.

The power plant consists of three 6½ in. x 8 in. Sterling motors which on test developed 120 h.p. each or a total of 360 h.p. The operation of these engines has been most satisfactory in every respect since their installation. The engines are controlled entirely from the engine room, communication with the bridge being had by means of electric signals. Three copper gasoline tanks with a total capacity of 2400 gallons, are installed in a tight copper lined compartment flooded by the sea. This compartment is built of steel sheathed with two thicknesses of ⅞ inch tongue and groove yellow pine and this material copper lined. Two scuppers of ample size lead overboard from the fuel compartment and the vents from the tanks lead into the open air also.

The hull is divided by 8 transverse watertight steel bulkheads, 5 of which are complete without doors. The boat was designed so that any one of the compartments might fill without materially affecting the boat's trim. The small boat equipment consists of an 18 ft. double planked power tender, a 14 ft. and a 12 ft. dinghy. (A crew of seven men is carried.)

The owner's stateroom, fitted with two full sized double berths.

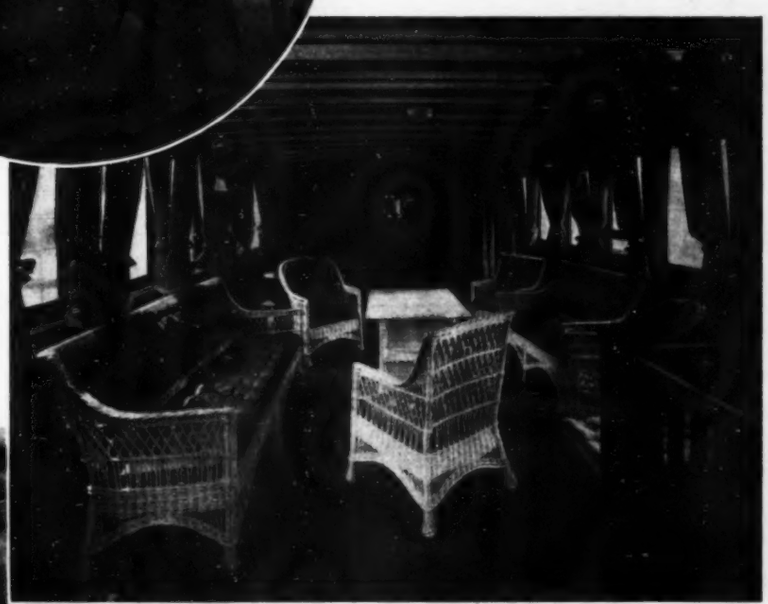
A corner of the galley.



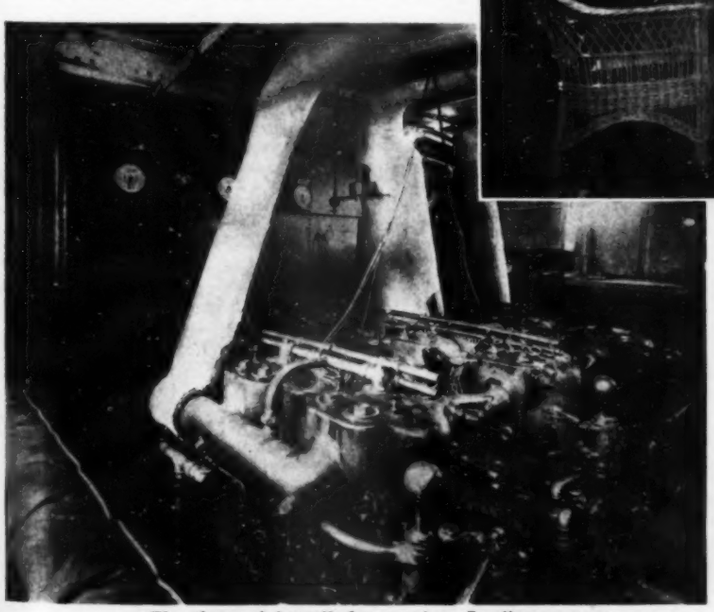
The dining saloon looking forward.

Elmasada II is most handsomely furnished throughout and is the largest Sterling powered motor yacht yet to be launched. She is lighted and heated throughout by electricity and her enormous fuel capacity gives her a cruising radius of about 1500 miles, at an average of 14 miles, while it is possible to obtain a maximum speed of 17 miles if desired. The electrical plant consists of a 7½ k.w. General Electric generator with two 120 ampere hour Duplex Edison storage batteries. The galley is very commodious and fully equipped and it contains a large Shipmate range for cooking purposes.

The arrangement of the quarters below decks is worthy of note. The location of the rooms for the owner and his guests just aft of amidships insure the greatest comfort possible when the boat is running outside in a heavy seaway. A passageway into the after end of which the owner's state room opens, runs the length of the living quarters with the various state rooms opening into it so that the occupants of the different rooms are absolutely independent of each other. The state room on the port side just forward of the owner's stateroom, communicates with it by means of a swinging door and with the passageway by a sliding door, as does the large bathroom in a corresponding position on the starboard side,



Interior of after deckhouse looking forward.



The three eight-cylinder, 120-h.p. Sterling motors.

so that the three rooms can be used independently or en suite. The passengers' quarters are separated from the forecastle and galley by a distance equal to about one-third the length of the boat, the intervening space being taken up by the engine room, storage space and the fuel tanks. A short passageway leads aft from the forecastle to the galley and on the starboard side of this is a good sized stateroom for the skipper, while on the port side are the berths for the engine room force and the stewards. The crew have access to the deck from the galley.

Mention should be made of the luxurious fittings of the dining saloon which contains a handsome buffet, mahogany table, glass closets, etc., and of the after or lounging saloon which has desks and bookcases and a talking machine to help while away the hours at sea or in the evening. Not only has Elmasada II shown herself to be a good sea boat, but her clean cut lines and smart appearance are features not always found in craft possessed of sound and seaworthy qualities.

NEW MOTOR BOAT DESIGNS

Building a V-Bottom

One of the Latest Models Built by Mr. Foster, who is a Firm Believer in the V-Bottom Type of Construction for a Boat of Moderate Size.

FROM time to time we have shown various designs by J. L. Foster, of Orcas, Wash., who has developed a type of boat known as the Foster V-bottom, and we are enabled to add to these designs the construction plans of one of his latest models which we show below.

This craft is 18 ft. 9 in. over all with a beam of 4 ft. 4⅞ in. and a draft of 8⅞ in. for the hull and a draft of 1 ft. 4½ in. at the wheel. Although constructed along similar lines, this craft is somewhat different from the 27-footer which was illustrated last November and the 18-footer which was described in April.

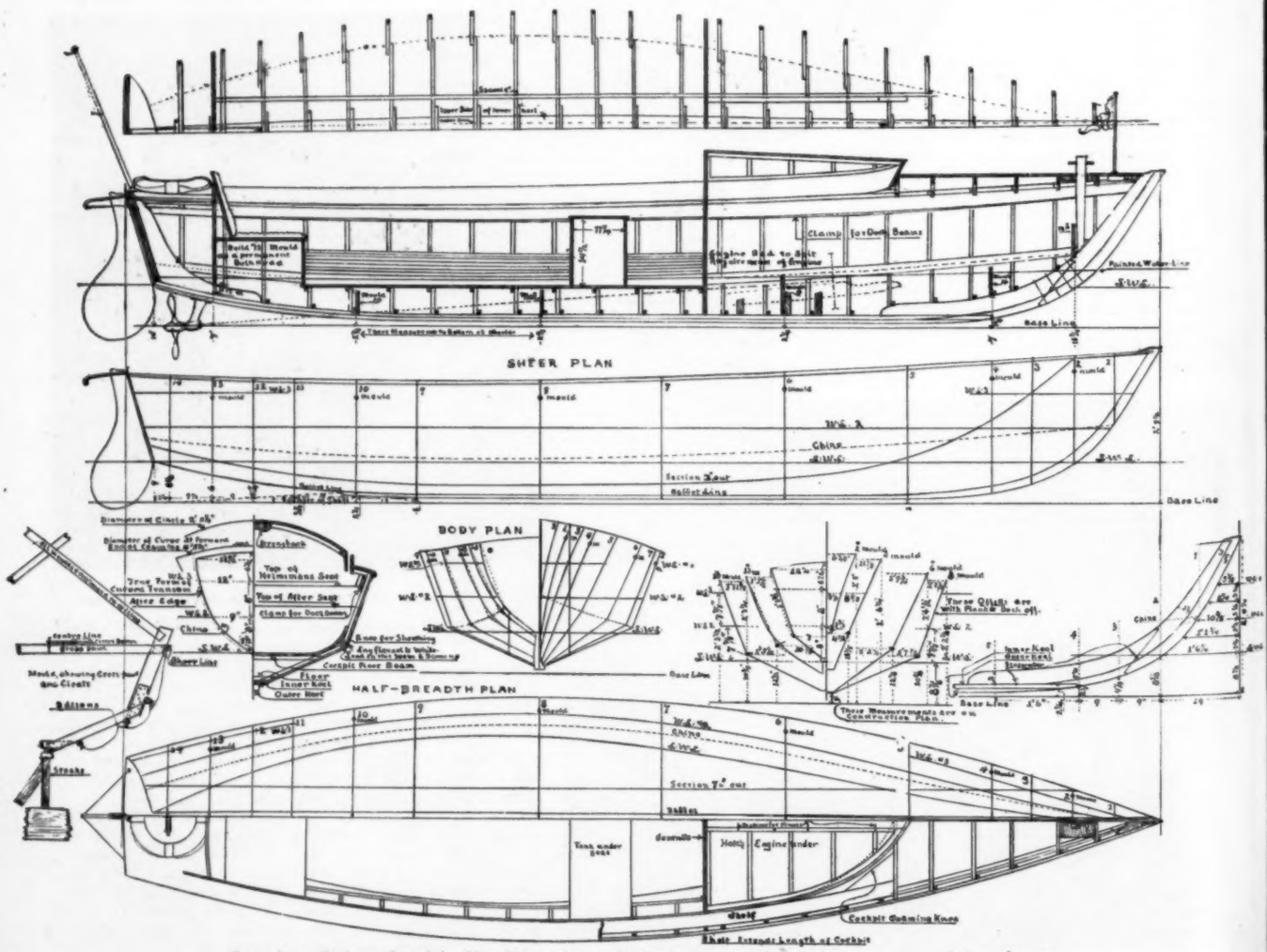
In 1893 Mr. Foster designed, built and sailed a small V-bottom yawl-rigged yacht which was the second of this type which he had sailed and was more successful even than had been anticipated. She was of unusually sound construction and was used for eight years of hard sailing before being disposed of, in practically as good condition as when first built. This type of boat so appealed to Mr. Foster that he used the same model when the gasoline engine first came into prominence and had made an ingenius combination of strength, speed and seagoing qualities. The finished boats are very smooth and have the seams running fore and aft in a line with the flow of water around the hull.

Mr. Foster believes that this type of craft is very simple to construct, when handled in the proper manner. These boats are built right side up on the stocks and no elaborate false work is needed as when building bottom up. The stocks may be made from any material at hand, although the best is a foot width plank longer than the boat and not over 2 inches in thickness, to allow clinching the heels of the frames under the inner keel.

After the stocks are in place the keel is shaped by the plan, and the after end is steamed and bent over a form of a slightly less radius than the curve of the keel up to the transom. This can be flattened out a bit to fit after it is in place on the keel. The inner keel or back rabbet is shaped by the plan, steamed, bent and screw fastened on top of the keel. The stem and transom are set in place and fastened by the plan, these being carefully plumbed and squared.

The molds are then set up at the proper marks across the keel against cleats and are kept in line by a center batten about 9 inches with one edge on the center marks from stem to transom. Four stiff battens on each side are then fastened to the molds, stem and transom, after which a bevel can be laid across the keel with the steel arm resting on the lowest batten. This will give the exact angle at which the heel of the lower frame should be sawed for fastening on the keel.

The frames are sawed out in pairs, clamped



Complete design showing Mr. Foster's method of constructing his very successful 19-footer.

to the battens and are fastened either by nailing and clinching into the inner keel or by screwing them fast. After the lower frames are in place, each pair is connected by a floor of oak and fastened by screwing into the back rabbet. After the boat is off the stocks, these may be further fastened by galvanized nails or bolts through both keels.

To obtain the angle of the upper frames at the chine, one of them is laid against the two upper battens and where this passes the lower frame at the knuckle or chine, a pencil mark should be placed on the upper frame, along the under side of the lower frame and a mark also along the top batten which lies on the sheer marks on the molds, to give it the proper length. These frames are not beveled to fit the side but lie square across the planking, thus saving much labor. The plan will show the manner in which they are planked, bored and nailed, after which the projecting extra length of the lower frame should be sawed off along the line of the upper frame.

Mr. Foster uses small oak knees at the chine at every frame, as shown in the plan, and to give additional strength to the structure, each lower frame is braced to its adjoining one by the cockpit floor. The work is finished by sheathing narrow strips over the knees. This stiffens the framework and gives a close flooring which is much more desirable than the open slat flooring.

The deck beams are sawed out to the required curve or camber, a true radius of a circle and are then fastened to the upper frames in the same manner that the frames are fastened together. They are also fastened to the clamps, as shown in the plans. After the coaming knees and the shelf in the wake of the coaming are in place, the molds can be taken out and the planking begun. A single width of plank is sufficient for the top sides in boats of this type up to 19 feet in length, the lower edge of the plank being designed to follow the chine.

In order to fit the rabbet line of the stem, the angle of the stem should be measured and marked at the end of the plank, to give the true shape. At the stern three short saw cuts about 15 inches in length should be made with a narrow-kerfed saw so that the curve will be taken care of at the after end without difficulty. After the plank is clamped down, it should be fastened by galvanized boat nails clinched or else with screws.

The bottom planks are laid in 6-inch widths and for the garboard a spiling is made with a piece of very thin material sufficiently long but roughly cut and clamped into place. Beginning at the stem, marks should be ruled across it and the stem at short intervals and at longer intervals along the keel, the intervals being shorter again at the stern. A pair of compasses may then be set from the rabbet line to a point far enough back to clear the edge of the plank and at every one of these points a segment should be drawn. After removing from the frames, the staff should be laid and the 6-inch wide board which is to be used for the garboard strake, and the compasses set back to the compass marks along the garboard on each line. After removing the staff, a thin batten should be sprung to the compass marks and fastened with fine brads so that its edge touches each segment. A line should then be drawn along it and the plank ripped and dressed to the line by a plane. The other garboard should be marked to this and shaped. After fastening a spiling is taken from the upper edge of the garboard strake the same way and the remaining one is handled in the same manner.

To obtain the shutter the plank itself is clamped at the stem and braced or else roped and wedged against the opening and a line is drawn around it inside and outside. This gives the general shape, but the lines should be saved as there will be some fitting later.

This 19-foot boat makes an excellent seaboat, and as Mr. Foster has built a number of them himself, his ideas are not theoretical but practical. This type of boat will keep up a good speed without splashing in the lap of a sea, and although she is designed for only moderate power, she will turn a fair amount of speed, owing to her somewhat unusual lines.

A 35-Foot Cruising Boat.

A Raised Deck Craft Showing a Good Amount of Seaworthiness and which can be Built at a Moderate Expense.

THE plans upon the following page are those of the 35-foot raised deck cruiser of the plumb stem and round transom stern type, designed by Swasey, Raymond & Page, Inc., of Boston, for Mr. Frank L. Cross, of Wollaston, Mass., who is using her for cruising in the vicinity of Fisher's Island Sound, having moorings at Mystic, Conn.

Her lines are designed for seaworthiness and show by their flare forward and good buoyancy that she is designed to have excellent seagoing qualities, for they have unusual deadrise and depth and are as long as possible. The rabbet and the frames aft are of an "S" section to improve steering before a sea and to let all bilge water lie in the after part of the boat and not in the cabin. The sides are carried up the entire length, except at the after deck, in order to obtain more freeboard.

The boat embodies features of design, power installation and arrangement of living quarters that should make her very able and splendidly adapted to her owner's requirements. Strength and reliability have been thoroughly brought out, but the requirement of a fair turn of speed was not overlooked. The lighting is by electricity.

Mr. Cross knew what should be in a small cruiser to obtain the most comfort, and did not desire a lot of "two by one-half" staterooms. He wanted room to turn about without falling into someone else's way, and thus the arrangements were worked out.

The construction is especially strong, the planking being 1-inch yellow pine, the frames white oak 1⅝ x 1½ inch spaced, 10 inches at centers and 5 inches in the way of the engine. The keel is white oak 5 inches thick, protected by an oak shoe. Yellow pine stringers, oak deck beams and teak exterior finishing are some of the important features.

The number of low skylights, cowls and ventilating hatches compares favorably with many more pretentious yachts, the after deck being protected by an awning which extends aft from the forward house. Boat chocks are provided for carrying a tender on the port side of the deck, and davits are provided. Hatches and cowls assure ventilation and access to below decks. This boat carries an auxiliary rig, consisting of a jib and mainsail, for use in fair winds or emergency, which also adds to her appearance and is one more feature added to her seaworthiness.

The cabin is unusually roomy and convenient and has comfortable accommodations for sleeping three or four persons. The arrangements below deck are complete. Commencing forward is a large water tank in the fore peak, and next aft is the toilet room with usual fixtures and a hatch for ventilating and giving access to the deck. Aft of this on either side are two large clothes closets. Next comes the main cabin, which is 9 feet long and has unusual floor space, so that there is room to put chairs around instead of sitting on transoms, as is usual. On either side are built-in berths with drawers and lockers underneath. At the after end of the cabin on the port side is a desk and on the starboard side is a sideboard. The cabin has a large skylight 6 feet long and 3 feet wide over the floor space, giving 6 feet 4 inches headroom throughout this room. The room is lighted and ventilated by this skylight and a cowl ventilator.

Next aft is the galley and engine room, which is especially well found. On the port side is a working bench which may be converted into a berth for the engineer, and under this is a large icebox and tool lockers. Also on the port side between the engine and this berth is the auxiliary machinery and electric light dynamo with switchboard, etc. She has a very complete electrical outfit.

The engine is a 20 h.p. 4-cylinder 4 x 6 Ralaco, which turns a 24 x 24-inch propeller 600 r.p.m. and gives a speed of 9½ miles an hour. On the starboard side of this room is the galley, which has a sink, dresser, food locker and coal stove. This galley is located conveniently so as to serve food in the cabin or the cockpit and is bulkheaded off from the engine by a sliding bulkhead. The lower half slides up to give access to the engine, and the stove is right next to the companionway, so all smoke and smell will go out of the cabin immediately. This room is ventilated by a cowl and an autoforce ventilator.

In the cockpit, the gasoline tank is placed under the box in the center at the forward end, thus simplifying piping, etc., keeping the weights in the center of the boat and assuring a gravity flow of gasoline for the engine, no matter how much the boat rolls. This is not always obtained when the gasoline tanks are in the wings.

This box makes a very good seat and also can be used as an outdoor dining table. The gasoline tank contains 100 gallons, which gives her a cruising radius of about 300 miles. The remainder of the cockpit, with the exception of the seat in the after end, which is large enough to sleep comfortably one person, is left clear for deck chairs.

On the port side is the steering wheel and all engine controls are led near this wheel. The cockpit is provided with a khaki awning and side curtains and the forward part will have transparent panels to keep out spray when running, similar to a windshield.

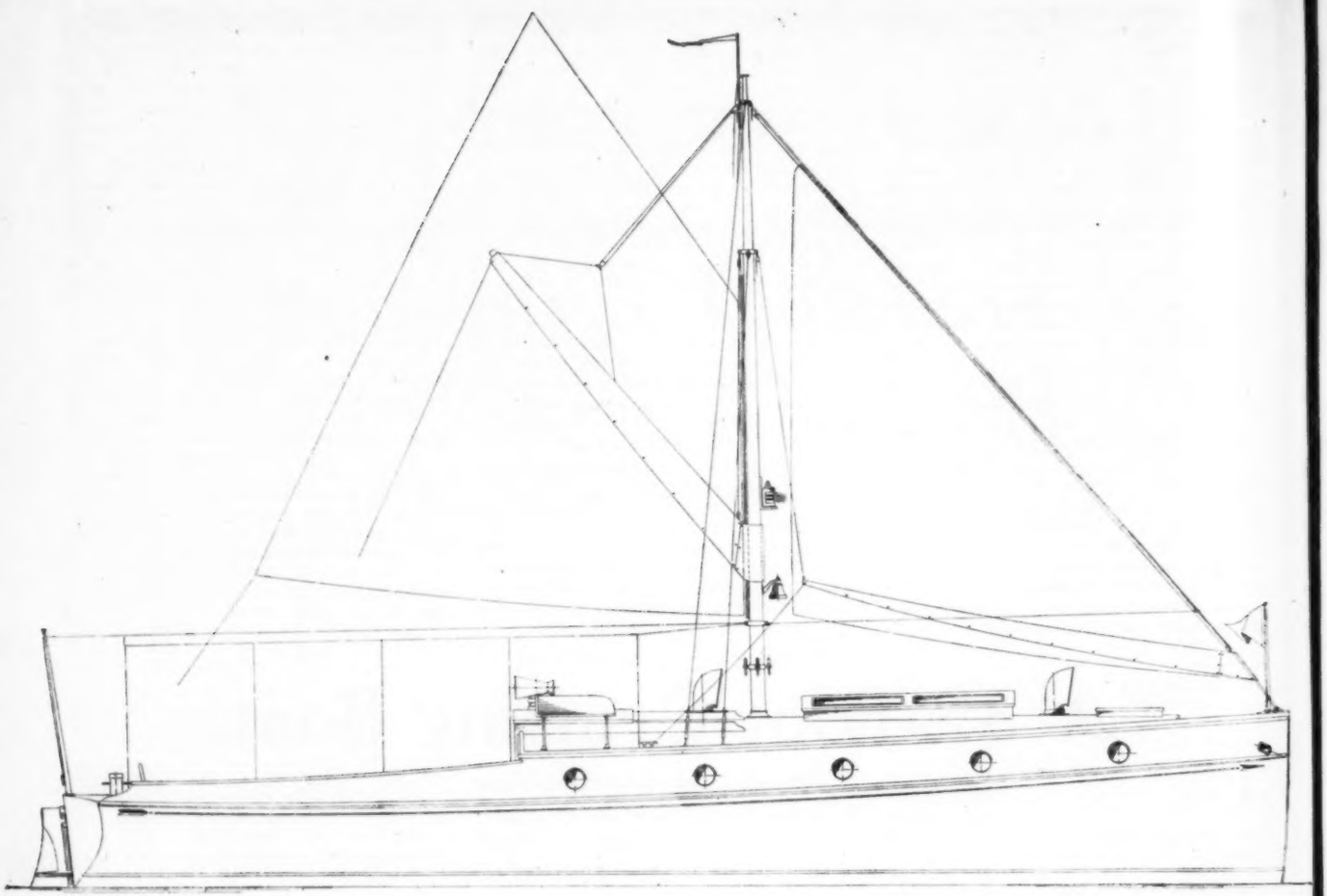
The deck arrangement is very simple and the cockpit is deep enough to give security and keep small children from falling overboard.

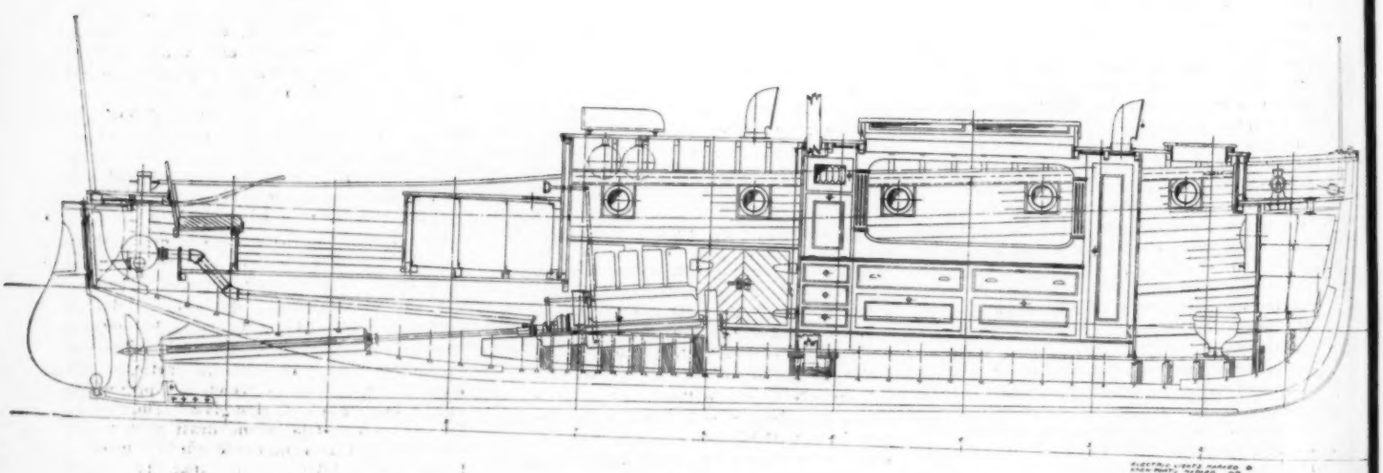
It will be noticed that this craft carries an outboard rudder of a type which has proved popular among vessels of this class. The use of such a rudder reduces the draft to little more than the actual depth of the wheel, which in this case is a trifle less even than that of the keel. There is considerable dead wood, and although this may reduce her speed a trifle, there is much consolation in the thought that the wheel and rudder are well protected even when running in shallow waters. A skeg thoroughly protects the wheel itself, and it is very doubtful if even the most unskilled navigator could so manouver as to take a blade from the propeller.

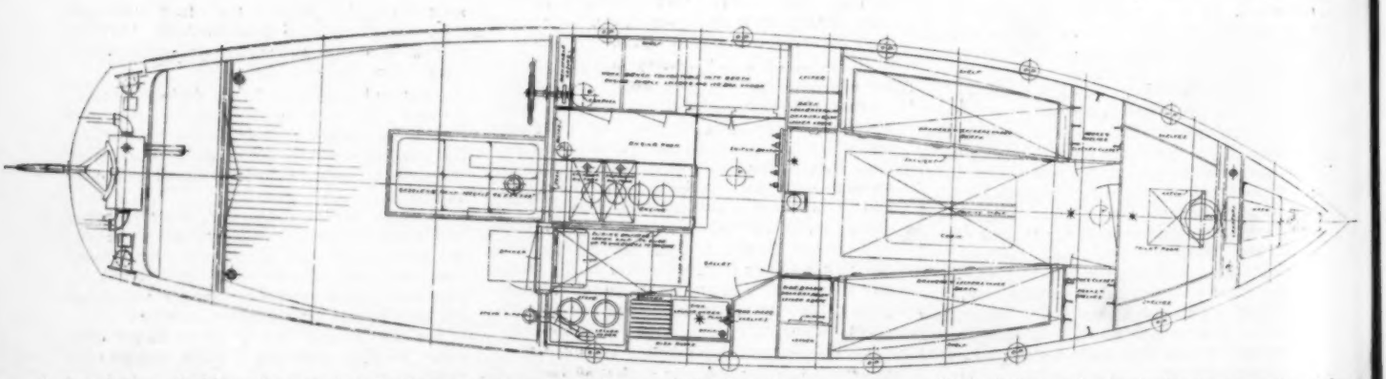
Light and ventilation below decks is secured through five port lights upon a side and through a double skylight in the deck above the sleeping quarters. The motor is close to the cockpit and is further ventilated by a cowl ventilator.

With all her comforts and conveniences it would be almost impossible to get more into the same length and get a well proportioned boat, and she seems to be an ideal, small, inexpensive and attractive cruiser for a man and his wife to live on the entire summer.

She can be built for $3,000 to $4,000 complete, varying with the locality, engine and outfit.



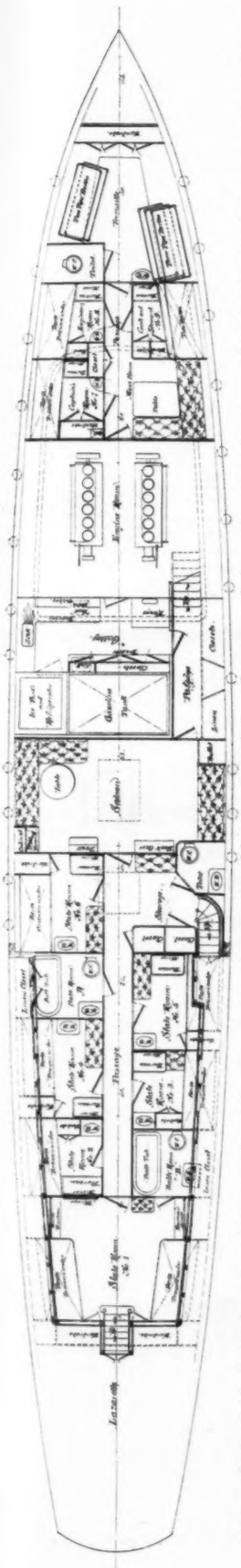




A description of this 35-foot cruiser by Swasey, Raymond & Page will be found upon page 25. She will be used principally for Sound cruising.

Lady Betty, a 123-Ft. Motor Yacht

The Design of One of the Largest Yachts Propelled by Internal Combustion Engines.



Below decks, Lady Betty is very well arranged and her layout is an interesting object lesson of the advantage of the motor over the steam plant for boats of the same size as her accommodation is equal to that of a much larger steam yacht.

WE are enabled upon this page to present the profile and arrangement plan of the 123-foot twin-screw yacht Lady Betty, which was illustrated and described in our August issue. This yacht was recently completed by the New York Yacht, Launch and Engine Company, from designs of Gielow & Orr, of New York City, for Mr. Walter Lippincott, of Philadelphia. The motor equipment consists of two six-cylinder 100 h.p. Twentieth Century motors, driving propellers especially designed by Mr. Gielow. On her trial trip her speed exceeded 14 miles per hour, which is very good for a vessel of this class.

The length on the load waterline of this yacht is 112 feet, the beam is 18 feet 6 inches and the draft 5 feet 9 inches, all the dimensions having been determined with a view to securing excellent seagoing qualities. Forward, for a distance of 58 feet, the sides of the hull are carried up to a raised deck, and after this for a distance of 30 feet is a teak cabin trunk 18 inches in height. A flush deck 18 feet in length extends to the stern.

The crew's quarters are in the forward part of the vessel immediately aft of the collision bulkhead, extending the full width of the vessel. They include staterooms for the captain, engineer, cook and steward and also an officers' mess room. Immediately aft of this is the engine room 13 feet in length, at either end of which is a watertight steel bulkhead.

Aft of the engine room is the galley and aft of this are the gasoline tanks enclosed in steel watertight bulkheads. The saloon is 10 feet in length and there are five single staterooms, one double stateroom, two bathrooms and one toilet room in the after part of the vessel.

The dining saloon is forward on deck and is 22 feet in length, being handsomely fitted.

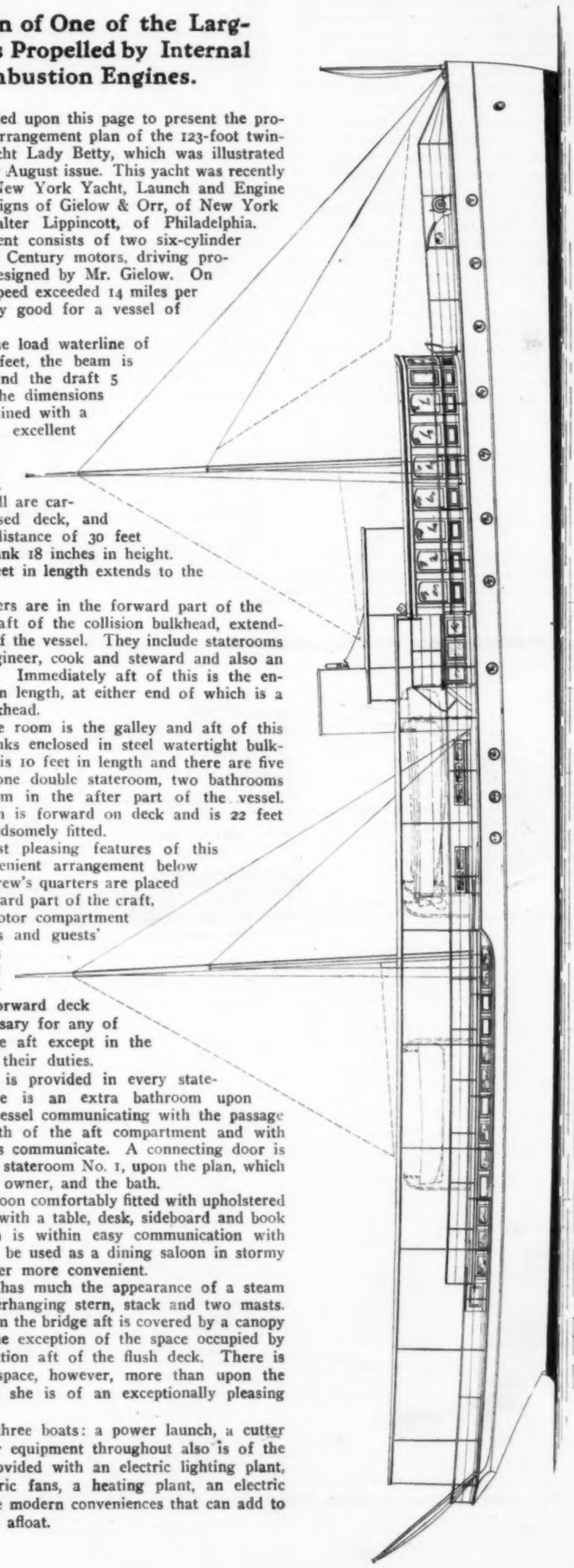
One of the most pleasing features of this vessel is the convenient arrangement below deck whereby the crew's quarters are placed in the extreme forward part of the craft, separated by the motor compartment from the owner's and guests' quarters. The crew's quarters are entered through a companion hatch in the forward deck and it is not necessary for any of the crew to come aft except in the performance of their duties.

Running water is provided in every stateroom and there is an extra bathroom upon either side of the vessel communicating with the passage extending the length of the aft compartment and with which all the rooms communicate. A connecting door is also placed between stateroom No. 1, upon the plan, which is designed for the owner, and the bath.

Amidships is a saloon comfortably fitted with upholstered seats and provided with a table, desk, sideboard and book cases. This saloon is within easy communication with the galley so it can be used as a dining saloon in stormy weather or whenever more convenient.

The entire craft has much the appearance of a steam yacht, with her overhanging stern, stack and two masts. The entire deck from the bridge aft is covered by a canopy and is free with the exception of the space occupied by the trunk cabin section aft of the flush deck. There is considerable deck space, however, more than upon the average yacht, and she is of an exceptionally pleasing appearance.

Lady Betty has three boats: a power launch, a cutter and a dinghy. Her equipment throughout also is of the best and she is provided with an electric lighting plant, a searchlight, electric fans, a heating plant, an electric windlass and all the modern conveniences that can add to safety and comfort afloat.



Lady Betty has the appearance of a large steam yacht. She is equipped with two 100-h.p. Twentieth Century motors, which drive her at better than 14 m.p.h.

A Forty-Foot Cruiser.

THE profile, interior arrangement and construction lines of the craft shown below represent the work of Chas. S. Linch, naval architect, 52 South 23d Street, Flushing, N. Y., a smaller boat from whose designs we showed in the August issue of this magazine.

The length overall of this new vessel is 40 feet, with a waterline length of 39 feet, a beam of 9½ feet and a draft of 3 feet. Mr. Linch has given particular attention to the motor boat from a scientific standpoint and believes thoroughly in giving special attention to the effects of trim, stability, the proper design of the under water body, motive power, etc. He thinks also that the same attention should be given to these factors regardless of the size of the vessel, and many of his beliefs can be noted in their effect upon the design shown here.

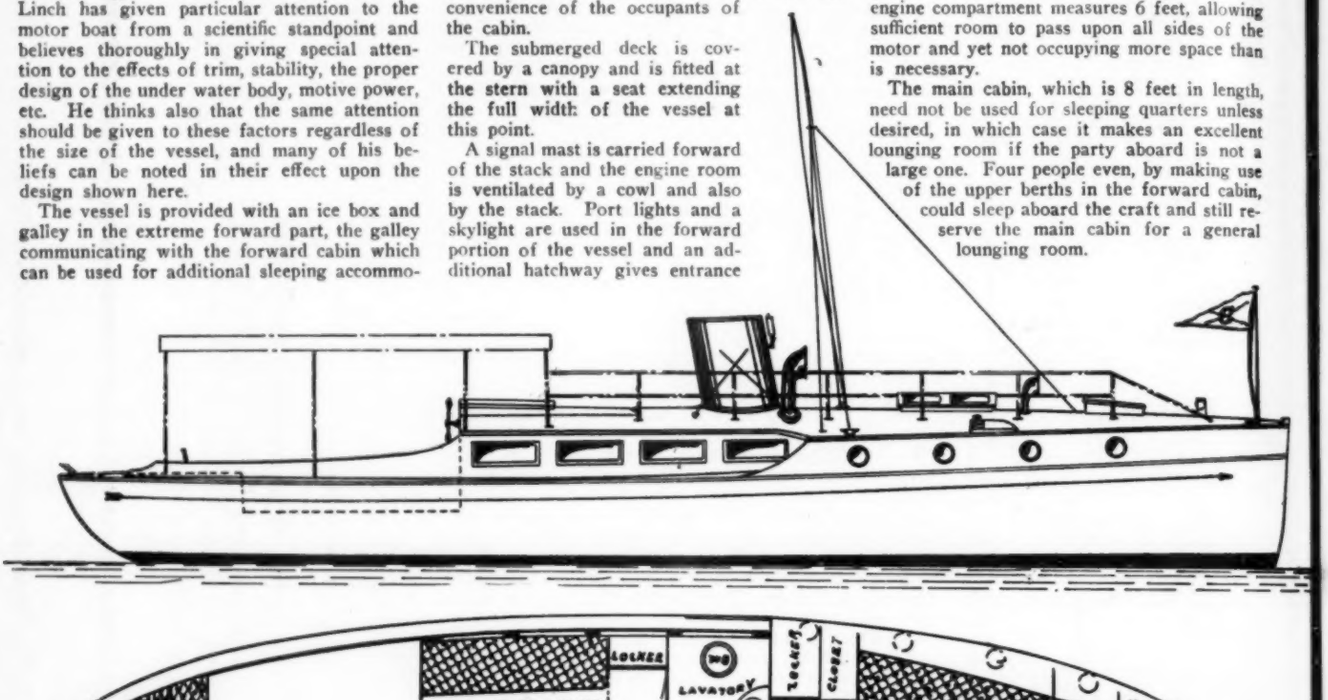
The vessel is provided with an ice box and galley in the extreme forward part, the galley communicating with the forward cabin which can be used for additional sleeping accommodations as well as for a dining saloon. The engine room is aft of this and contains a Lamb engine, lockers, work bench and a berth for the engineer. The main cabin is aft of the engine room and contains two extension berths. It is 8 feet in length and communicates with the submerged deck by a companionway. A lavatory upon the port side communicates with the main cabin and there is sufficient locker room to provide for the convenience of the occupants of the cabin.

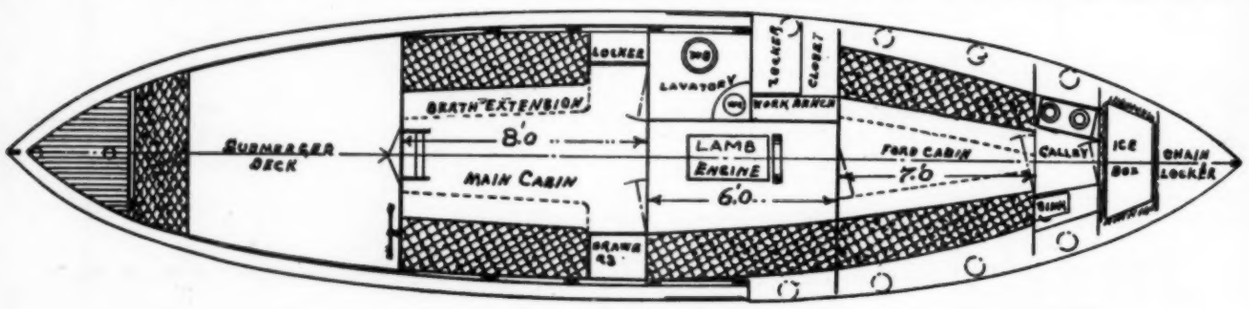
The submerged deck is covered by a canopy and is fitted at the stern with a seat extending the full width of the vessel at this point.

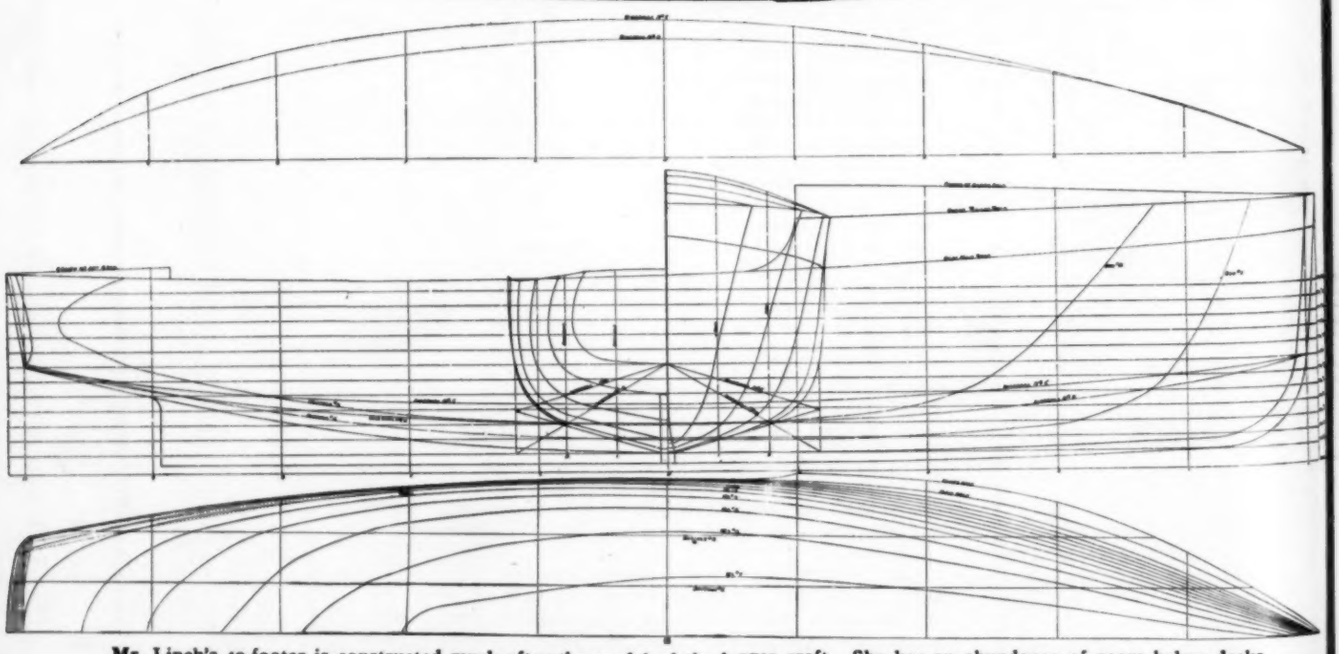
A signal mast is carried forward of the stack and the engine room is ventilated by a cowl and also by the stack. Port lights and a skylight are used in the forward portion of the vessel and an additional hatchway gives entrance to the crew's quarters. The steering is from the starboard side and the vessel can be handled by two men.

Considering the fact that this cruiser is but 40 feet in length it must be admitted that she has an abundance of room aboard and a party of four persons could be very comfortable upon a protracted cruise, each having a wide and comfortable lower berth to himself. The forward cabin is 7 feet in length and the engine compartment measures 6 feet, allowing sufficient room to pass upon all sides of the motor and yet not occupying more space than is necessary.

The main cabin, which is 8 feet in length, need not be used for sleeping quarters unless desired, in which case it makes an excellent lounging room if the party aboard is not a large one. Four people even, by making use of the upper berths in the forward cabin, could sleep aboard the craft and still reserve the main cabin for a general lounging room.







Mr. Linch's 40-footer is constructed much after the model of the larger craft. She has an abundance of room below decks.

A Safe and Sane Cruiser.

J. Walter Scott's Ideas of What the Ideal Cruiser Should Be Incorporated in the Design of His Teresa IV, the Excellent 39-footer Evolved from His Wide Experience.

IT required the wreck of a Titanic to incite public interest in an endeavor to suppress speed in ocean liners, and the question naturally follows whether a great storm will be necessary, causing the wreck of a number of so-called cruisers, before the average person realizes that speed, with meager accommodations for comfort and safety, is of little moment.

Mr. J. Walter Scott, of Detroit, Mich., has studied this problem until he has evolved a type of boat which, although only 39 feet in length, he believes contains all the accommodations and conveniences of a 45-footer.

This boat, which is known as Teresa IV, was built by the Bryan Boat Works of Wyandotte, Mich., and Mr. Scott was fortunate in having the able assistance of Carlton Wilby, Naval Architect, in laying out her designs. Mr. Scott believes that in designing a real cruiser, four qualities should be considered, in the order of Safety, Comfort, Convenience and Speed. Many owners, however, when giving instructions to their naval architects, reverse this order so that the average 40-footer is provided with a shallow keel of from 2½ to 3 inches, which is cut away aft, leaving the propeller shaft strutted. The stem and stern post are, according to Mr. Scott's ideas, too light, while the frames and floor timbers are spaced too far apart. The keel of Teresa IV was laid 4 inches deep, the frame being 1½ inches square and spaced on 10-inch centers, notched into the keel. A study of the designs will show also the unusual depth of the stem knees and the fact that a floor timber is laid for every frame; the frames are doubled at the engine bed.

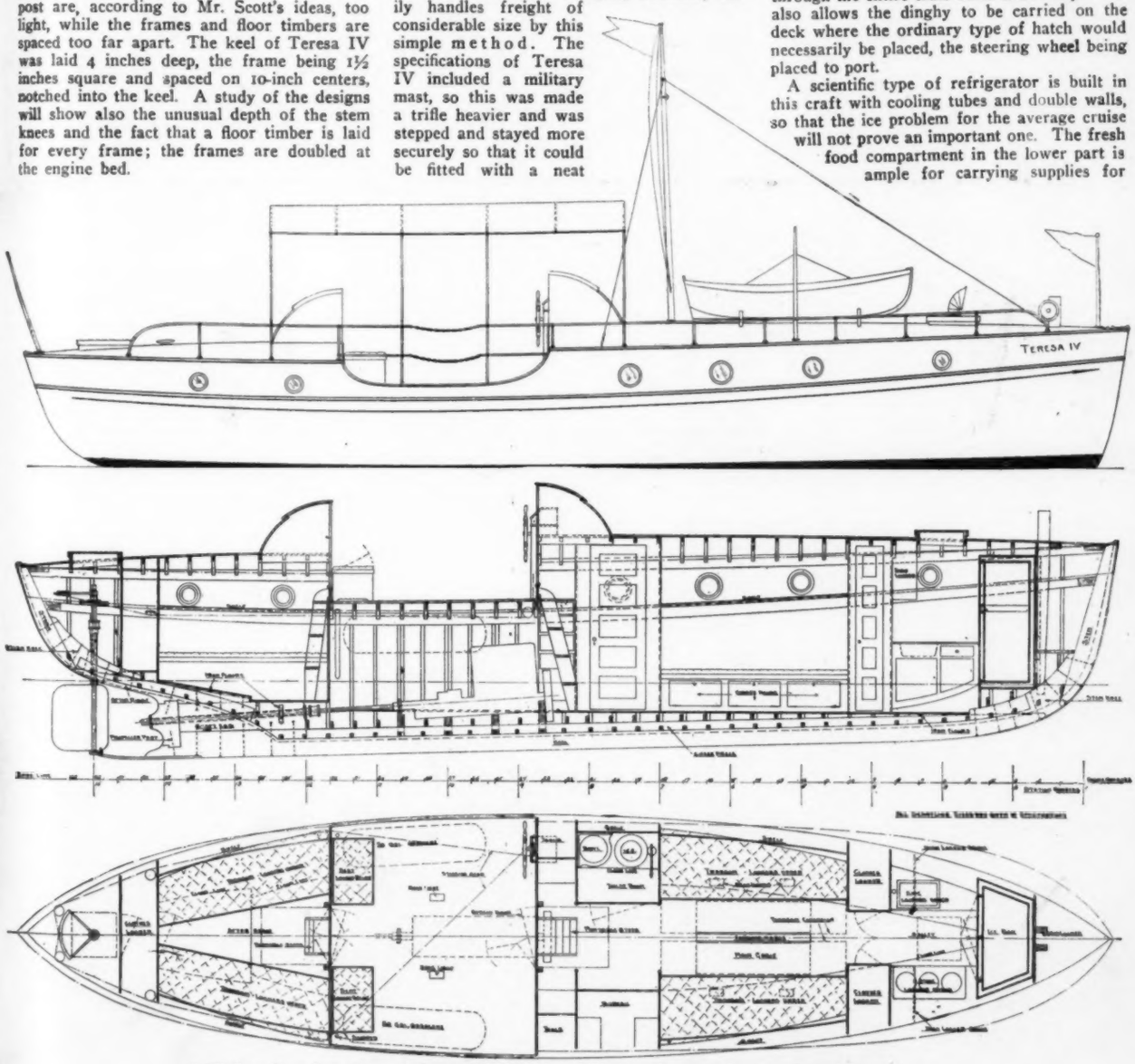
The boat is 39 feet 3 inches over all, with a 9-foot beam and she draws 2 feet 10 inches of water at the wheel. Two sets of bilge clamps are provided as well as sheer and deck clamps of substantial size, and the steering gear and all other equipment is unusually strong and complete. Two cylindrical seamless steel fuel tanks are cradled against the frames and a collision bulkhead is provided, adding a great deal to the safety of the craft.

So far as convenience is concerned, the specifications call for a Davis dinghy equipped with a bridle so it could be put outboard with a single davit. This idea was gleaned from the ocean liner, which, although she does not use her spar booms for swinging lifeboats, easily handles freight of considerable size by this simple method. The specifications of Teresa IV included a military mast, so this was made a trifle heavier and was stepped and stayed more securely so that it could be fitted with a neat boom and tackle. This provides a very strong equipment which could also be used in an emergency to rig a jury outfit which would run the craft before the wind should the power plant break down. No particular amount of thought was given to this detail however, as Mr. Scott places a great deal of reliance in the 1912 model of the 5" x 6" four-cylinder Doman motor which has been installed.

Owing to an even more than usual antipathy for mosquitoes, Mr. Scott has screened his boat in a very satisfactory manner and both the companionways have scuttle hatches fitted with doors. Two box hatches are also provided with screens and the forward one has a cowl fitted for bad weather. All the swing ports also have screens fastened with small screws.

Inasmuch as skylights are always more or less of a nuisance upon a small cruiser, Mr. Scott gave particular attention to this problem and has used a method of construction in which four rectangular dead lights are finished inside of the cabin with four mahogany frames. There are also two such dead lights in the bridge deck and as may be seen by consulting the plans there is an unbroken sweep of air through the entire craft when under way. This also allows the dinghy to be carried on the deck where the ordinary type of hatch would necessarily be placed, the steering wheel being placed to port.

A scientific type of refrigerator is built in this craft with cooling tubes and double walls, so that the ice problem for the average cruise will not prove an important one. The fresh food compartment in the lower part is ample for carrying supplies for



J. Walter Scott's 39-foot cruiser with all the comforts and conveniences of a 45-footer.

from four to six people and on account of the flare of the bow, the ice compartment also is unusually large, holding from 350 to 400 pounds. A reservoir is also arranged within the refrigerator to provide cold drinking water so that it is not necessary to open the refrigerator continually, as is usually the case.

Mr. Scott has had plenty of experience with Viking, a 45-footer which he had built two years ago and he learned a lesson from this craft of providing plenty of locker space for all aboard. A crew of five who lived aboard Viking for eight weeks, did not use all of the locker space and Mr. Scott believes that the comfort of the cruise was greatly increased by having a sufficient amount of available room. In proportion to her size, Teresa IV has even more locker space.

An ingenius arrangement has been made in the matter of extending the berths in the cabin to a permanent drop leaf table, a manner of support which was worked out by Mr. Wilby. This method not only allows a great deal more room both in the cabin and in the berths, but prevents the bed clothes from sliding about as they are very likely to do from a narrow berth.

Fresh water tanks are under the two locker seats on the bridge deck and are connected by a pipe so that the tanks will equalize, although not allowing the water to shift with any great rapidity. This arrangement together with the bilge keels which are provided, greatly increases the steadiness of the vessel and the large filler caps used facilitates filling and makes inspection a simple matter.

If the critical yachtsman should take exception to the fact that there is not full headroom under the bridge deck he should not lose sight of the fact too that this was considered in the design and it was thought much more desirable to leave the headroom as it is rather than to eliminate a number of excellent features that would otherwise have to be changed. Since the modern marine engine is a much better machine than that of a few years ago, full headroom in the motor compartment is not a necessity in any event.

Mr. Scott has spent a great deal of time in designing and working out a boat of moderate size that would do all the work and embody all the conveniences of a larger one and Teresa IV seems to suit his needs down to the smallest detail. She has been a product of evolution and for that reason she should prove a very satisfactory craft for her owner to navigate.

Teresa IV is fully equipped with an electric lighting plant and a close study of the plans will bring out many other desirable features.

Speed and Power of Motor Boats.

An Interesting and Non-Technical Discussion of a Few of the Relations Between the Speed and Power of Motor Boats with the Method for Obtaining an Economical Balance Between Them.

By Henry H. W. Keith.

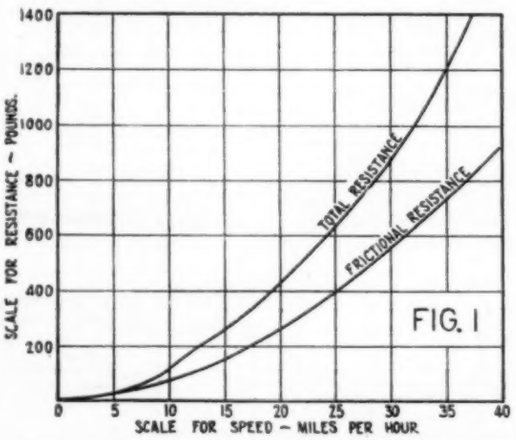
There is probably no motor boat problem so surrounded with mystery and uncertainty as that concerned with the relation between speed and the necessary power to obtain it. This is due in part to the unstable character of resistance and the relation between its dependent factors. Experiments and experience are important deciding points, yet on the other hand there are certain empirical formulæ that when correctly applied give a very close approximation. This article by Mr. Keith, who has spent many years experimenting with models and has gained a wide experience on the subject, is a most valuable one for the amateur and in it he has treated the subject in a thorough and non-technical manner.—Editor.

THE problem of speed and power of motor boats, while not so important as for large ships, nevertheless should be given some attention. For one thing, the question is generally uppermost in an owner's mind as to how much speed his boat ought to show for a certain horsepower engine, and it should be of satisfaction to him if he is able to make a good estimate for himself without relying too much upon guesswork. In other cases a knowledge of the speed and power of the boat is of financial value, for the economy of the fuel may be an important item on long trips, and it is advantageous to settle this question beforehand. It is consequently the purpose of this article to give a simple, non-technical explanation of some of the principles in the problem, with the idea of making them not so troublesome as imagined.

In order to calculate the power an engine will require to drive a boat at a certain speed, or to calculate the speed at which the boat will be driven by an engine of known horsepower, it is first necessary to know the dimensions and trial results of some boat which has the same proportions and same shape as the one in question. The data of this similar boat is then used as the basis for a comparison, which, if made according to certain simple rules, enables us to find the speed and power for the new boat.

When it is possible to find another boat in which all the dimensions of the hull are exactly proportional to those of the new design, and whose speed and power are known, the problem becomes fairly simple. Everything then is directly comparable, and no guesswork is required. For large ships the easiest way, in most cases, to obtain this data for a similar hull is to have a small model made exactly to scale and to have it tested in a model basin. This method satisfies the necessary conditions of similarity, but for ordinary small boats the cost of such a test is prohibitive, except perhaps for expensive racers. Consequently, we have to look for some other boat which will serve as a model upon which we can base our comparison. In general, for motor boats, the results of the search are not very satisfactory, due to the great variations in types.

An estimate of speed and power of motor boats is also a more troublesome problem than for large ships, for the reason that reliable data concerning the dimensions and trial results of the former is quite scarce. Motor boats are seldom given such careful and extensive trials as large ships have to undergo because their speed and power under conditions of service are not such important financial considerations, but for large ships we can almost always find the dimensions and fairly good trial data of a ship quite similar in form to the new one. With small boats, the dimensions that have the most influence upon speed, viz: length on the waterline, area of midship section, and the displacement, are hardly ever given in published descriptions and these are just the ones we need most. If dimensions other than these are used for estimating speed by comparison, the result is of correspondingly less value. This fact, taken with the absence of accurate trial data makes a published description of small use in our problem.



Speed-resistance curves of a high-speed displacement boat 40 ft. in length. The hump in the curve is due to the coincidence of the bow and stern waves which occurs at a certain speed.

RESISTANCE.

IN order to get a proper idea of the relation between speed and power, it is first necessary to understand what is meant by resistance and how it is measured. Resistance is the force required to maintain a certain speed of the boat through the water. This force may be either a pull or a thrust. For instance, when one boat is towing another, the pull on the tow-rope is the resistance of the boat that is being towed. When a boat is driven by a propeller, the resistance is directly overcome by the thrust of the propeller. The easiest way to measure resistance is to tow the boat, and by means of a spring or other weighing device, find out the pull exerted by the rope for several different speeds of the boat. By taking a sufficient number of speeds fairly close together and measuring the corresponding pull, a curve of resistance can be drawn through the plotted values. This gives us resistance at any speed, whether measured directly or not. It should be borne in mind that by "speed" we mean the speed of the boat through the water. For instance, if a boat traveling 10 miles an hour, as measured by marks on the shore, is going against a tide moving one mile an hour, the speed of the boat through the water will be 11 miles per hour. If traveling with the tide, its speed is only 9 miles per hour.

The upper curve in Fig. 1 shows a characteristic curve of total resistance for a high speed motor boat 40 feet long on the waterline and having a displacement of 4000 pounds, and consequently gives the pull on a tow-line necessary to maintain the boat at any speed. For example, at a speed of 30 miles per hour, the resistance is 875 pounds.

It will be noticed that there is a slight hump in the curve between 10 and 15 miles per hour. This is due to the fact that the crests of the waves made by the bow coincide with the crests of the waves made by the stern, causing the boat to drive a little harder. It is beyond

the limit of this article to discuss this property of resistance curves, as it involves a considerable study of waves, but it is well to state that this hump generally occurs when the speed is about twice the square root of the length of the boat.

FRICTIONAL RESISTANCE.

THE lower curve in Fig. 1 gives the frictional resistance for the same boat. The calculation of values for this curve is quite simple. It is based on a number of model basin experiments upon "friction planes." These are simply long planes of small thickness having various kinds of surfaces, that is, painted, varnished, etc. They are towed vertically through the water at different speeds, and their resistance is measured. The planes are so thin in comparison to their length that there is no wave making and the resistance is therefore taken as all frictional. From these experiments, the friction per square foot of wetted surface of the planes is found for any speed. These values are used for the wetted surface of the boat, that is, the surface of the immersed portion, even if it is curved. The following table gives values of friction in pounds per square foot of wetted surface for various speeds in miles per hour for smooth, well painted surfaces. For surfaces comparable to fine sand, the values would be about twice as much, while for surfaces covered with marine growth or barnacles, the friction would be increased very considerably. It is thus easy to see that for racing boats the bottom should be kept as smooth and clean as possible. To find the frictional resistance for any particular boat, multiply its wetted surface by the friction per square foot, as given in the table.

TABLE OF FRICTIONAL RESISTANCE.

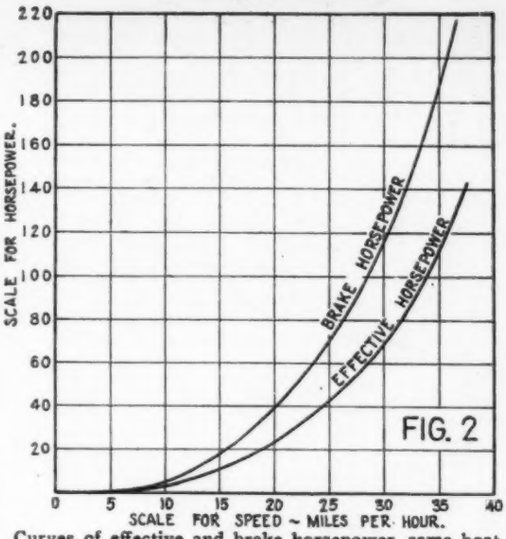
Speed Miles Per Hour	Friction Pounds Per Sq. Ft.
5	.07
10	.55
15	1.16
20	1.96
25	2.97
30	4.17
35	5.54
40	7.09
45	8.83
50	10.72

For example, the boat for which Fig. 1 is drawn has a wetted surface of 134 square feet. For a speed of 30 miles an hour, the frictional resistance will be $4.17 \times 134 = 559$ pounds, as given by the curve.

The wetted surface of motor boats is best determined from the lines themselves. This is rather a tedious process and requires explanation beyond the limit of this article, although not very difficult. The idea is to develop the curved surface of the immersed part of the hull into a plane, and then measure its area. There are also approximate formulas for wetted surface some of which give very good results.

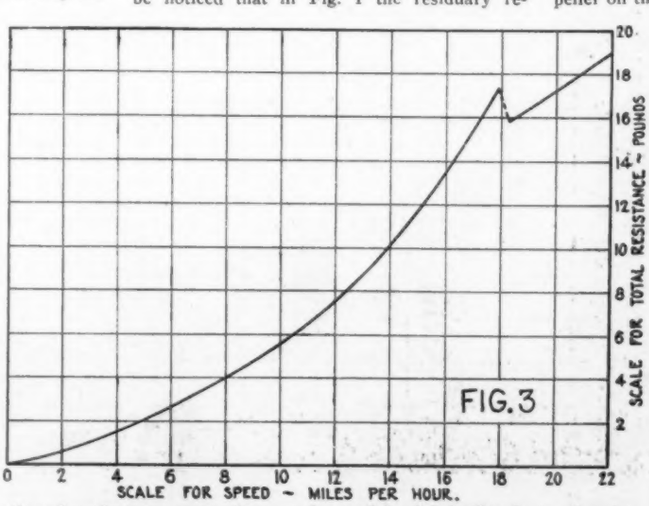
RESIDUARY RESISTANCE AND LAW OF COMPARISON.

RESIDUARY resistance is the difference between total and frictional. It is made up of the resistance caused by wave and eddy making. The importance of knowing how much it is for a given boat lies in the fact that for similar boats it follows the law of Comparison. By means of this law we can easily estimate what it will be for all other boats similar to the one for which it is known. A simple statement of this law is that when $\frac{M}{\sqrt{L}}$ is a constant for two boats having the same proportions, $\frac{R}{L^3}$ is also a constant.



Curves of effective and brake horsepower, same boat as Fig. 1.

M is the speed in miles per hour, L is the length on the waterline in feet, and R is the residuary resistance in pounds. To make this clearer, the residuary resistance at 30 miles an hour for the 40-foot boat of Fig. 1 is 875 — 559 = 316 pounds. Suppose we wish to know what it will be for a 30 foot boat of like proportions. For the 40-foot boat $\frac{M}{\sqrt{L}} = \frac{30}{\sqrt{40}}$, and $\frac{R}{L^3} = \frac{316}{(40)^3}$. For the 30-foot boat these quantities must be the same at some one speed, but since L is now 30 instead of 40, M and R will also have new values, that is $\frac{M}{\sqrt{30}} = \frac{30}{\sqrt{40}}$ and $\frac{R}{(30)^3} = \frac{316}{(40)^3}$ as before, whence $M = \sqrt{\frac{30}{40}} \times 30 = 26.0$ and $R = \left(\frac{30}{40}\right)^3 \times 316 = 133$. In other words, multiply the old speed by the square root of the length ratio to find the new speed and the old residuary resistance by the cube of the length ratio to find the new value. Thus at 26 miles an hour, the new value of R for the 30-foot boat will be 133 pounds. The calculation for other speeds is made in the same way and a complete curve of R can be plotted upon speed. It will be noticed that in Fig. 1 the residuary resistance is not so much as is the frictional. This should be true for all well designed high speed motor boats.



Speed resistance curve for a 7-ft. model of a hydroplane, showing drop in resistance when planing takes place.

TOTAL RESISTANCE.

TOTAL resistance is the sum of the residuary and the frictional. We have been able, by means of the law of comparison, to calculate the residuary resistance for the 30-foot boat, and it is also a simple matter to calculate the frictional. First we must know the wetted surface. This is easily found, for similar boats have wetted surfaces proportional to the squares of their length. For the 30-foot boat, the wetted surface will be $\left(\frac{30}{40}\right)^2 \times 134 = 75$ square feet. Multiplying this by the values given in the table will give the frictional resistance for the speeds in the table, and its curve can then be drawn. The sum of the two curves, residuary and frictional, gives the total. Thus from the experiments made upon the 40-foot boat we have been able to calculate the total resistance for a 30-foot boat instead of being obliged to resort to experiment for that also.

EFFECTIVE AND BRAKE HORSEPOWER.

THE information given by resistance curves finds its practical value in calculating the horsepower required of the engine. From the total resistance we can find the effective horsepower, or power required to tow the boat at a given speed and from this the brake horsepower is estimated. In Fig. 1 the speed is given in miles per hour, and the resistance is in pounds. One mile per hour is equal to 88 feet per minute, so that if we multiply the speed by 88, we get the number of feet that the boat moves in one minute. Multiplying this by the resistance in pounds gives us the foot pounds of work to be done in one minute. One horsepower is equal to 33,000 foot pounds per minute, so that the horsepower required will be the number of foot pounds divided by 33,000. For example, if the total resistance at 30 miles an hour is 875 pounds, the effective horsepower will be $30 \times 88 \times 875 \div 33000 = 70$ horsepower.

To find the brake horsepower or power which the engine should develop, the effective horsepower must be divided by the efficiency of the propeller and shafting. This is because a certain amount, a third or more, of the power of the engine is lost by the propeller, and by friction in the shaft bearings. Therefore, the engine must be powerful enough to make up the loss, and still have the propeller deliver the required effective horsepower. For another thing, some of the power of the engine is used in overcoming the suction exerted by the propeller on the stern of the boat, and all of these things must be allowed for. If we assume a propeller and shaft efficiency of 65 per cent. and allow 5 per cent. for other losses, the brake horsepower required by the 40-foot boat of Fig. 1 will be, at 30 miles per hour, 70÷60/100=117 horsepower. Fig. 2 gives curves of effective and brake horsepower derived from Fig. 1 in this way. It is plainly evident from them how fast the power climbs up with increase in speed. The propeller efficiency is taken as 65 per cent. for all the speeds, although it may vary slightly in actual cases. For boats having a large skeg or thick deadwood obstructing the flow of water to the propeller, the loss due to suction, etc., may be 10% or more.

APPROXIMATE FORMULAS.

There are a number of approximate formulas in use for estimating speed and power.

They are generally derived from resistance or power curves, by means of the law of comparison. Their use enables one to make an estimate by means of the dimensions of the boat instead of by an actual test of the model or other similar boat. Consequently a reliable formula is the means of saving expense and time. For small boat work they are ordinarily accurate enough, except perhaps in the case of racers and for unusual types. For these the speed and power must be determined by more refined methods.

For large ships the best known approximate formula is the Admiralty formula, found in all text books on Naval Architecture. This is written H. P. $= \frac{D^{2/3} V^3}{K}$

where D = displacement in tons of 2240 lbs.
V = speed in knots (6080 ft. per hour).
K = Admiralty coefficient.

This formula can be used for motor boats if the values of K are chosen properly. That is, boats having the same K should be of about the same class, and also have $\frac{V}{\sqrt{L}}$ about equal, L being the length of the boat. Published data for motor boats seldom includes the displacement, however, so that it may be difficult to find values for K beforehand, but for a few special cases K equals 200 to 250. For the 4000 pound boat of Fig. 1, K equals 222 at 26 knots, or 30 miles per hour.

In an article on propellers in June, 1911, MoToR BoatinG the author gave a formula for estimating speed and power from the length and beam. Data for these is more available than displacement or midships section area, so that comparisons are more easily made. The formula referred to is $M = C\frac{\sqrt{L \times P}}{B}$

where M = speed of boat in miles per hour.
L = length over all in feet.
B = beam in feet.
P = brake h.p. of engine (or engines).
C = a coefficient varying from 8 to 10 or 11, and which should be determined from similar boats.

This formula will give an estimate generally accurate enough for choosing a propeller, but is not recommended for refined work.

Approximate formulas are used as the basis for various rating rules, their object being to determine a boat's speed by making a few simple measurements of dimensions and horsepower and applying these in the theory of resistance. The A. P. B. A. rules have given good results in handicapping boats of some types and their formula for speed, given by Mr. Chapman in an article on "Measuring" in MoToR BoatinG for March, 1912, is

$$V = 4.32 \sqrt[6]{L.W.L.} \times \sqrt[3]{\frac{H.P.}{M.S.}}$$

where V = speed in knots.
$M.S.$ = product of beam on the waterline and the draft at a point one-fifth the beam in from the side of the hull, all in feet.

The value thus obtained for $M.S.$ is used as an approximation to the actual area of the midships section.

MOTOR BOAT FORMS.

Much has been written about the proper forms for motor boats as regards seaworthiness, and it is obvious that a seagoing boat should be designed for safety rather than for speed. The conditions a boat is expected to meet are largely a matter of locality, and it is the business of a naval architect or builder to know the proportions and forms for boats suitable for their own waters.

The problem of speed in smooth water is best solved by model basin experiments, and it is easily possible from them to determine the best form for this point of view. The two considerations—seaworthiness and speed—are generally opposed to each other, and a compromise is then necessary to give satisfactory results. In regard to length, the longer the boat is in proportion to its other dimensions, the greater its frictional resistance will be. On the other hand, the wave-making will be less for the longer boat, so that it is evident that there is some length which gives the lowest total resistance.

Variations of the ratio of beam to draft, and also of the shape of the midship section, provided the area of the latter is kept the same, appear to have little real effect upon speed. The area itself of the midship section is quite an important factor, and although it is generally determined by questions of stability, for low speeds it should be greater than for high speeds. This, of course, in boats of the same length and displacement.

The shape of the ends of the boat is a subject upon which there is a large difference of opinion. Model basin experiments have shown that up to high speeds, twice the square root of the length, a boat with U-shaped sections forward, and V-shaped sections aft is the fastest in smooth water. This amounts to saying that the waterline should be fine at the bow and full at the stern. For extreme speeds, hollow waterlines are seldom, if ever, found, although there is not enough data about them to say whether or not they would be better for the question of speed alone. Broad flat sterns prevent squatting, and although desirable for speed, are bad for seaworthiness, and for anchoring in disturbed water.

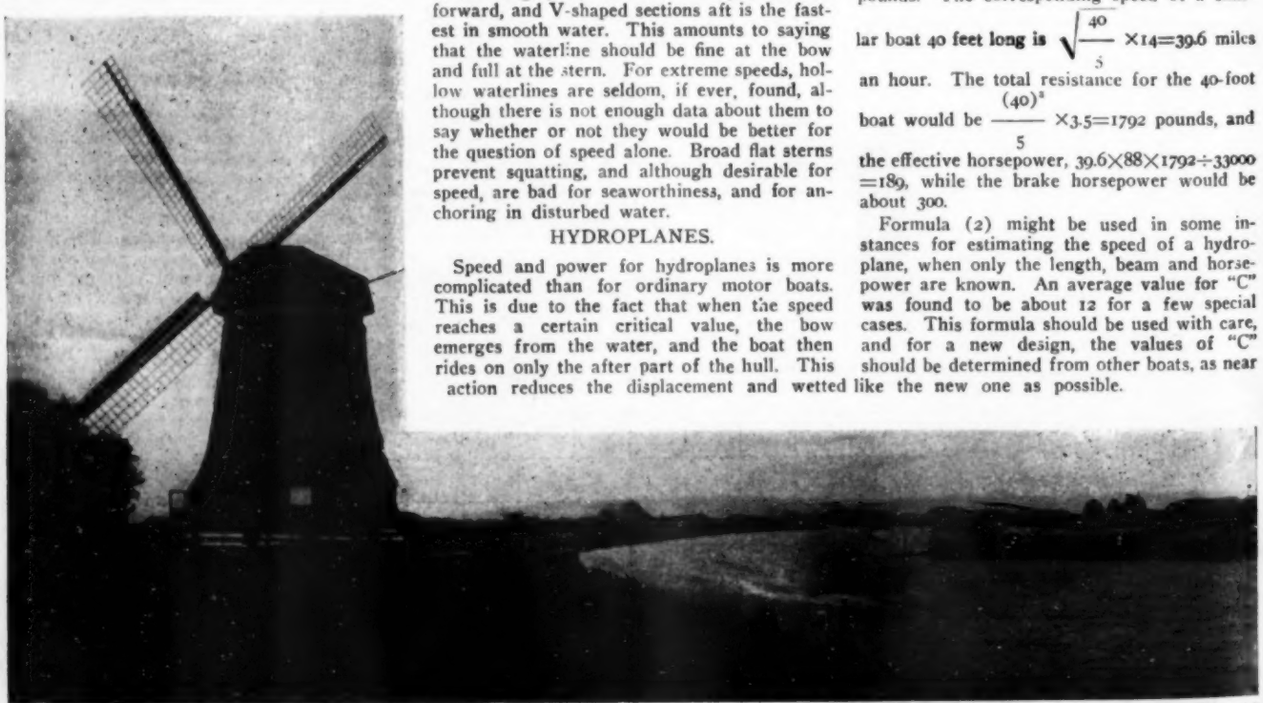
HYDROPLANES.

Speed and power for hydroplanes is more complicated than for ordinary motor boats. This is due to the fact that when the speed reaches a certain critical value, the bow emerges from the water, and the boat then rides on only the after part of the hull. This action reduces the displacement and wetted surface considerably, consequently the resistance curve should show a falling off as compared with boats of ordinary form. This feature is shown in Fig. 3, which gives a curve of resistance for a 7-foot model of a hydroplane. There is apparently an abrupt drop when the speed is about 6 or 7 times the square root of the length of the boat. The drop may or may not be as abrupt as shown, but tank experiments have proved quite conclusively that the resistance becomes much less when planing takes place, and whether this takes place suddenly or not, depends upon the type of boat. For well designed hydroplanes, the resistance should rise more slowly after the critical speed is reached. If it does not, no gain is derived from the planing action. The fact that the bow rises at high speeds, is due to the upward component of the resistance becoming large enough to exert some lifting power. This force, resulting from the trim of the boat, is first felt at the bow. Then it travels along the boat's length as the speed increases, until it comes under the center of weight of the boat. Here the boat can no longer lift, and the only way that the increasing force can be taken care of is by lifting the stern also. This results in lifting the whole boat, naturally allowing the boat to drive more easily. The speed at which the stern begins to lift varies with the type, and is a matter for model tests. Experiments have shown that the angle between the plane and the surface of the water should be about 2 or 4 degrees for the best results when the boat is planing. This does not mean that the trim when at rest should be this amount, but when the boat is under way. Consequently, it may be necessary to shift the weights a few times before the results are satisfactory.

Once we have a resistance curve for a hydroplane model, the method of finding the engine's horsepower for the full-sized boats should be modified somewhat from that for ordinary craft. Up to the critical speed it is fair to assume that the hydroplane behaves like other motor boats, so that up to this point the horsepower can be determined the same way. Beyond this speed, there is doubt as to whether the residuary resistance still follows the law of comparison previously explained. A few tests having indicated that the best estimate of power is made by using total instead of residuary resistance, thus making the correction for friction unnecessary.

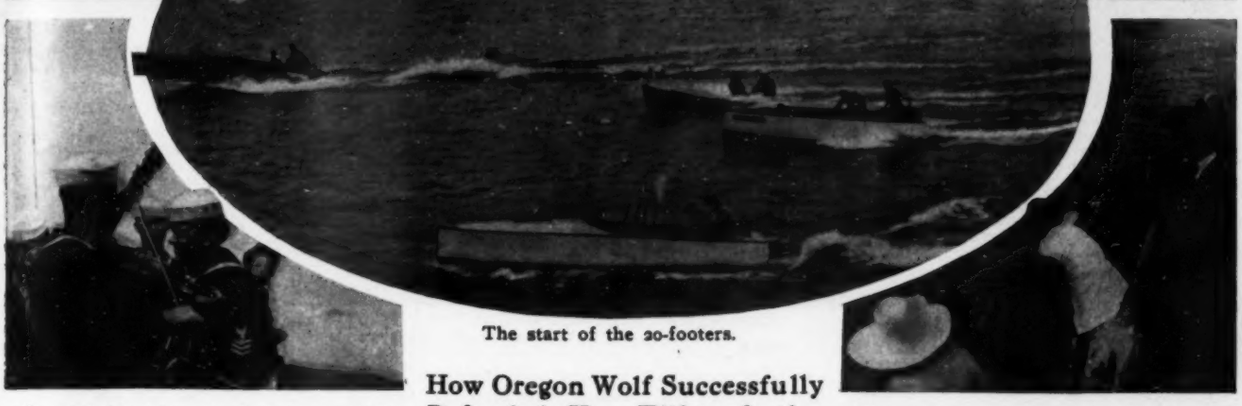
For instance, suppose the total resistance of a 5-foot model at 14 miles an hour is 3½ pounds. The corresponding speed of a similar boat 40 feet long is $\sqrt{\frac{40}{5}} \times 14 = 39.6$ miles an hour. The total resistance for the 40-foot boat would be $\frac{(40)^3}{5} \times 3.5 = 1792$ pounds, and the effective horsepower, $39.6 \times 88 \times 1792 \div 33000 = 189$, while the brake horsepower would be about 300.

Formula (2) might be used in some instances for estimating the speed of a hydroplane, when only the length, beam and horsepower are known. An average value for "C" was found to be about 12 for a few special cases. This formula should be used with care, and for a new design, the values of "C" should be determined from other boats, as near like the new one as possible.



A Dutch scene up-to-date. The runabout, Fortuna II, owned by Messrs. Hultzen and Van Willigen of Amsterdam and powered with a 45-65 h.p. Sterling motor, is one of the finest outfits in Holland.

The Pacific Coast Championship



The start of the 20-footers.

How Oregon Wolf Successfully Defended Her Title of the Fastest Boat on the Pacific Coast at Recent Regatta at Astoria, Oregon

By A. V. Comings.

ASTORIA'S Seventeenth Annual Regatta has come and gone—and Oregon Wolf is still the champion speed motor boat of the Pacific Coast. A year's effort to beat the 1911 champion came to naught and the victory this year for Johnny Wolff's great boat was even more pronounced than when she first went into the championships a twelve-month ago.

When Milton Smith's clean running Vamoose first showed its paces at the Bellingham meet in July, it looked very much as if the Wolff boat would meet its match at the Astoria races, for the Smith entry showed a wonderful burst of speed. But the racing bugs were doomed to disappointment, for Vamoose never at any time during the Astoria meet showed stamina enough to even worry Oregon Wolf and certainly no other boat on this coast ever gave Wolff a moment's uneasiness.

Aside from the second consecutive winning of the Pacific coast championship on the part of the Wolff entry, the Astoria meet this year was rather featureless. Many new boats were entered in the various classes, but, with the exception of Swastika, of Portland, none showed more than average speed, and in these days when motor racing enthusiasts feel few thrills unless the contestants are going up around forty miles an hour, the thrills at Astoria were few and far between.

Not that the meet was uninteresting. For it was very interesting and the thousands who went down to the City by the Sea for the three days meet were well entertained indeed. The Astoria Motor Boat Club boys never do things by halves and this year was no exception.

The meet opened Tuesday morning, August 27, with the first heat of the twenty-foot class, which brought out a field of five starters. Of these five, the Swastika was the only one that showed any kind of speed and the Portland boat, in spite of the fact that its drivers did not let it out at any time to its full speed, won the heat of twenty miles in 37:05 2-5, distancing its nearest competitor, the Chehalis II by over fifteen minutes. Vogler Boy was a slow third.

Great interest centered in the second event of the first day, the first heat of the free for all, and when the flag was dropped on as pretty a start as was ever seen on the west coast, four boats, all of real class, sped down the waters of the Columbia toward the first turning buoy. Oregon Wolf led the field, with Vamoose, Wigwam II, last season's 26-foot champion and Potlatch Bug, a Seattle entry.

Everyone knew that Potlatch Bug and Wigwam II were not in the running for first honors, barring accidents, but they did look for a real race between Vamoose and Oregon Wolf and as it was the first time those two boats had faced each other in a real test interest was at a white heat.

For two laps the racing bugs were not disappointed, for Vamoose showed splendid speed and it looked as though Johnny Wolff, that clever old fox among Pacific coast motor boat racing men, had at last met his match. But it was not to be, for on the third round Vamoose developed engine troubles and had to withdraw, leaving the field to those two old rivals, Wolf and Wigwam, the Potlatch Bug having early withdrawn on account of engine troubles.

Wigwam II at full speed. Her motor is a 6-cyl. Leighton.

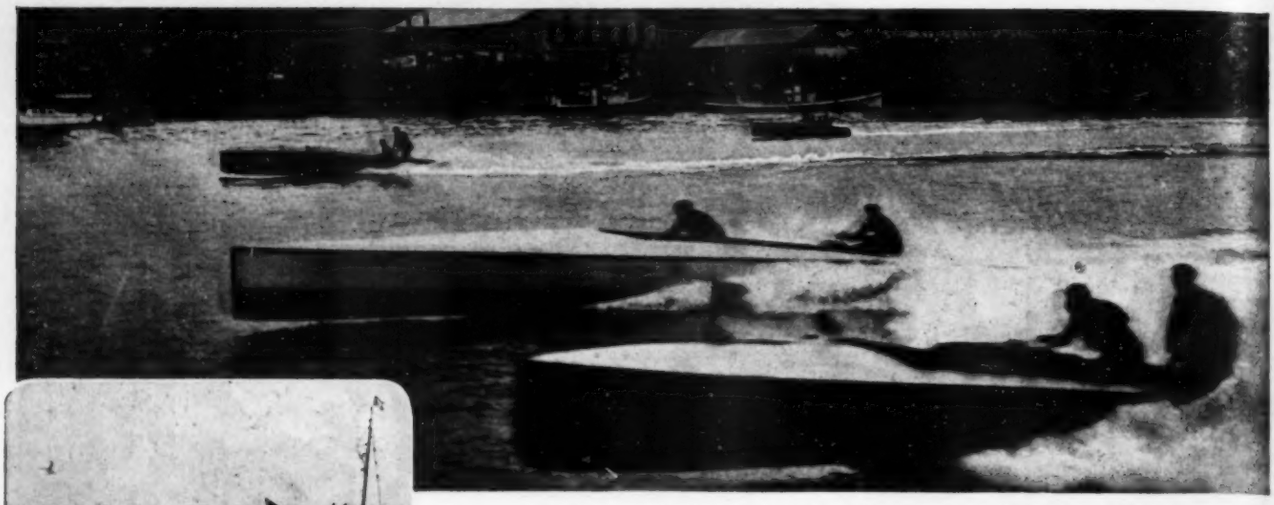
The result was easy to foresee, and when Oregon Wolf crossed the finish line Wigwam II was a good three minutes behind, in spite of the fact that Wolff closed down his engine as soon as Vamoose was out of the way and he knew he had only the Wigwam to contend with.

Things looked encouraging in the twenty-six foot class when that race was called, for there were several new boats to contest honors with Wigwam II, last year's champion and still one of the best boats in her class in the country. But Wigwam was all in from her two hard races of the morning and did not go into this heat, the only boats facing the starter being the Vamoose, Chehalis and Vogler Boy. Unfortunately Vamoose was unable to start in this race until the other two boats had been at least fifteen minutes on the way, but when she did get into the game she showed that she could go when she had to. In spite of her handicap, she passed the Chehalis and had there been another lap would easily have passed the Vogler Boy. As it was she had to be content with second place, the Vogler Boy taking first and the Chehalis third.

The afternoon of the first day was given over to various miscellaneous races, chief among which was a contest among Columbia river fish boats with single cylinder, five horsepower motors.

The second heat of the twenty foot class was the first event of the second day of the regatta, and again Swastika had things all her own way and was back at her stable, blanketed, fed and ready for another race before the next boat to her had much more than finished the third lap. Her time for the twenty miles was 34:29, and she was not let out at any time, her drivers not caring to push her to her utmost when it was so unnecessary. Vogler Boy was second in this heat with Humming Bird third.

There was no competition in the second heat of the 26-foot class, the next event, as Wigwam II had for her opponents the Vogler Boy and the Humming Bird, both boats any amount slower than she. So Binkley jogged her around the twenty miles in 40:28, content to



The start of the free for-all which was won by Oregon Wolf.

The crew of the Point Adams Life Saving Station capsizing a self-righting lifeboat.

take first without an effort.

With no real contests in the first two events of the morning the spectators looked to the free for all, second heat, for something really worth while and for a time they were given all they could desire. For there was a splendid field in this second heat, with Oregon Wolf, Vamoose, Wigwam II and Swastika lined up at the drop of the flag and for at least four laps things were mighty interesting. Then the inevitable happened to Vamoose, and down and out she was led to her quarters while the other three boats fought out the battle for honors.

Swastika had her first opportunity in this race to show whether she could handle the old Wigwam II and she showed it beyond question. Gradually she drew away from the 1911 champion and at the finish, though a minute behind Wolff, she was a full two minutes ahead of Wigwam.

The afternoon of the second day brought out several interesting events, chief among which was the race for cruisers, which was won by the Sarah Jane, belonging to W. A. and F. L. Knight, of Astoria, powered with a 32-40 H.P. Speedway. Nip, owned by Hansen Bros. of Astoria and powered with an Eastern Standard engine, was second and the Sea Otter, of Portland, last year's winner, was third.

Thursday saw the clean up of each event. The twenty footers went over the course first and Swastika for the third time had things all her own way, thereby winning first money, $300, while Volgler Boy, by annexing a third place in this last heat, took second money, $125. Chehalis II took the third pot, $75.

When the free for all was called there were but two starters, but the race developed the most thrilling exhibition of the entire meet. Already in possession of enough points to cinch first place, Wolff came out prepared to give the spectators their money's worth and he did it. Wigwam II was his only opponent, and in order to make it interesting Wolff held his boat down to such a nicety that the two boats were never separated a length during the entire thirty miles. And when the finish line was reached he let his boat out just enough to have her nose over in front of Wigwam by the narrowest of margins, with the result that the spectators were given cold chills of excitement even though they knew the Wolff could have distanced Wigwam if she had been driven to her utmost. As an exhibition of skill in handling a boat the heat was well worth watching, however, and it really was the banner exhibition of the meet.

By taking the three heats Wolff walked off with the biggest purse of the meet, $750. Wigwam, with her two seconds and one third, took second money, $325, while Swastika, with her one second, took $125.

The twenty-six foot class came to a finish in an argument, for Potlatch Bug came into the race for the first time in the last heat and by taking third place made the distribution of the money entirely different than it had been anticipated. The judges held, however, that Potlatch Bug had no place in the heat inasmuch as she had not contested in any previous heat and the result was that Vogler Boy, a comparatively slow boat, won first money, $300, while Wigwam and Vamoose, two boats that could cut circles around her at will, split second and third money as they were tied in points for second place. They received $100 each.

One of the most interesting events of the regatta came the afternoon of the last day when the Columbia river type of fish boats contested in a ten-mile race for a five horsepower engine donated by the Atlas Gas Engine Co. A large list of entries started at the pop of the gun and there was the usual bumping and shoving till the boats began to separate. Mike Vitalish finally came across the line a winner in this event.

Of the boats in this year's races, only two of the speedy ones were new. Of these, the Vamoose was the faster. She is a single step hydroplane built and owned by Milton Smith, of Ranier, Ore. Her engine is a six-cylinder Van Blerck and had Smith had an engineer who understood this engine there would doubtless have been a very different story to tell about the Pacific coast championship this year. The engine is set so that the propeller shaft goes out through the step at a slight rake. Her wheel is a 19 x 34 Hyde.

The Swastika, the other of the two new boats, is a monoplane twenty feet in length with a six-cylinder Leighton. Her performance this year puts her in a class with the fastest of the Pacific coast boats.

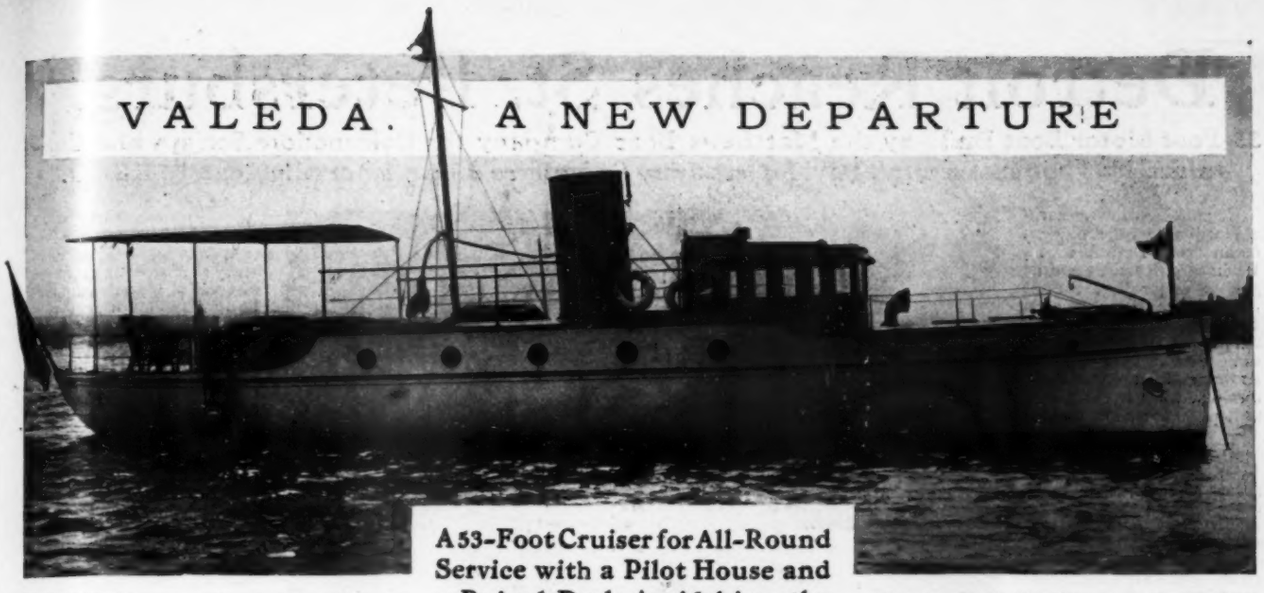
The Oregon Wolf and Wigwam II have both been described in these columns before. Wolff is still using his nine-cylinder Smalley, turning a 24 x 34 Columbian wheel, and has the same metal planes that he used last year.

The Wigwam has the same power, a six-cylinder Leighton, that she had last year, but the engine has been turned around and is now geared to the propeller shaft 4 to 5. She turns a Michigan wheel.

Visitors to Astoria were well entertained during the regatta by the Astoria Motor Boat Club members. As usual at the Astoria regatta, the social side of the event was taken care of by an admiral and his staff and John Beal, this year's admiral, came down from Portland prepared to do the honors in the very best of style. The result was that there was one continual round of gaiety and the Admiral's grand ball, proved a most brilliant social event.

Oregon Wolf, the champion of the Pacific Coast. She is powered with a 9-cylinder Smalley engine and is equipped with removable metal planes.

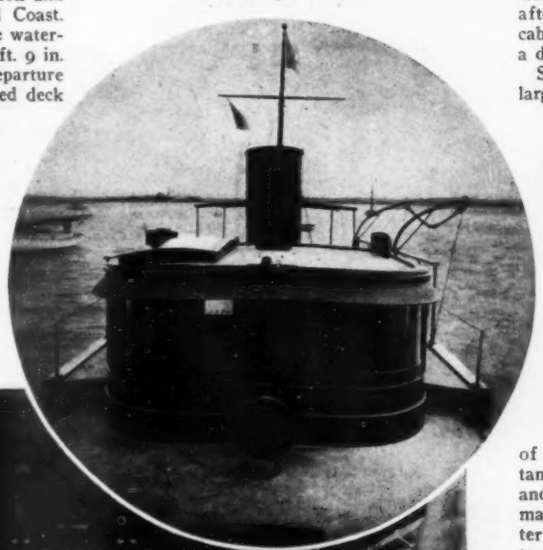
VALEDA. A NEW DEPARTURE



A 53-Foot Cruiser for All-Round Service with a Pilot House and a Raised Deck Amidships, the First of Several Built from the Same Design.

VALEDA was designed last winter by Messrs. Swasey, Raymond & Page, of Boston, for Mr. Wm. A. Hopkins of the same city, who used her during the past summer between Marblehead and Boston and for cruising along the New England Coast. She is a 53-footer, 49 ft. 4½ in. on the waterline, with 11 ft. beam and draft of 3 ft. 9 in. In design she is somewhat of a departure from the usual practice, having a raised deck amidships and the pilot house which has become so popular on the Pacific Coast. The lines show the boat to be thoroughly seaworthy, there being plenty of dead rise and freeboard with flare to the top sides forward and a flush deck aft.

Valeda is equipped with a four-cylinder 6½ in. x 8 in. 40 h.p., heavy duty motor and maintains a cruising speed of 9½ nautical miles an hour. She is handled ordinarily from the bridge deck, which is just aft of the pilot house and thoroughly protected by it, but for disagreeable weather there is a duplicate steering equipment in the pilot house. The floor of this structure is sunk considerably below the level of the deck decreasing its height and the motor occupies the space of limited headroom beneath it.



Looking aft from the forecastle, showing how the motor is installed in the space of low headroom beneath the bridge deck.

The arrangement below decks is similar to that of Gardenia, Topaz IV and Gee Whiz V, also designed by Messrs. Swasey, Raymond and Page and has become the standard arrangement with them for boats of this size. The full width galley occupies the space beneath the bridge deck and just aft of this there is a large saloon with transoms along either side. Aft of this is a toilet room to port and a lobby at the foot of the companion stairs to starboard with a hanging locker for oilskins, etc. The aftermost compartment beneath the trunk cabin, is a large well lighted stateroom with a double berth, transom, bureau, etc.

Sleeping accommodations are surprisingly large, providing room for a total of ten persons, as follows. In the forecastle, two or if transoms are used, four, one in the pilot house, four in the main saloon by using both Pullman berths and transoms, and three in the stateroom aft. All of the rooms are well found, the crew having a separate toilet room in the eyes and there are numerous clothes closets and lockers while the galley is situated so that either the forecastle or the main cabin may be served.

The gasoline tank is installed beneath the flush deck aft and has a capacity of 180 gallons and as 90 gallons of water may be carried, the boat is capable of a good cruising radius.

Watertight bulkheads are provided aft of the stateroom, between it and the gasoline tank and between the engine room and galley and careful attention has been given to the matter of exits in case of fire and to the matter of ventilation, all rooms having ventilators, open ports or windows, as well as hatches or skylights.

Valeda has proved herself an excellent cruiser for all-round service combining seaworthiness with an exceptionally trim appearance given by the careful placing of the pilot house, stack and signal mast.

The raised midship deck continues aft as the roof of the cabin trunk. Note the large removable hatch over the stateroom.

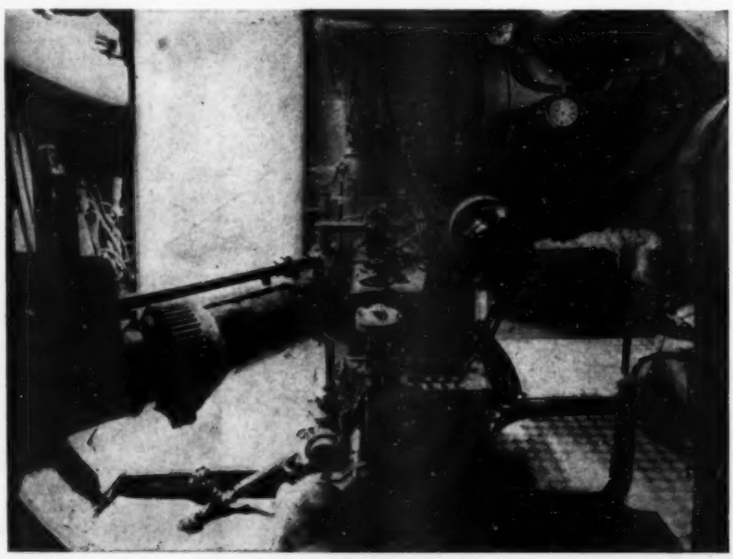
Detroit Reaches St. Petersburg.

35-Foot Motor Boat Built by the Matthews Boat Company for Commodore Scripps and Captained by Thomas Fleming Day, Successfully Completes a Run from Michigan to Russia.

Completing her remarkable trip across the Western ocean from Detroit to St. Petersburg, Russia, the little 35-foot motor boat Detroit reached the latter city on September 13th. Many readers of this magazine can remember without straining their powers of memory, when it was a hazardous performance to take a motor boat offshore even to the extent of a run to Block Island and to some people, the old tradition of unreliability which has so fondly clung to the internal combustion engine in spite of the many successful ocean races that are conducted nowadays, is yet to be dispelled. Perhaps it should be said that it was to be dispelled up to the moment the news "Detroit has reached Queenstown," was flashed to this country, for Captain Day and his 35-footer have proved conclusively that the internal combustion engine as constructed in this day and generation is thoroughly to be trusted.

W. H. Moreton, C. C. Earle, Jr., Thomas Fleming Day and Wm. E. Newstead, the crew of the Detroit.

Captain Day predicted before the start that the passage across the Atlantic would take about 21 days. As a matter of fact it consumed 21 days 16 hours, which is closer than many a mammoth liner comes to her schedule. Detroit left Martha's Vineyard, Nantucket, on July 16th. For the first three days she met good weather, but on the 20th she ran into heavy squalls and was obliged to heave to for the night. The 21st dawned with a strong gale from the north. At four o'clock the engines were stopped and the night was spent riding out the blow, the boat not getting under way again until afternoon of the 22nd. On the morning of the 29th, the crew were horrified to discover that the drinking water had turned bad and from this time until the Detroit reached Queenstown they suffered from lack of water. On the 30th they again were forced to heave to by bad weather.



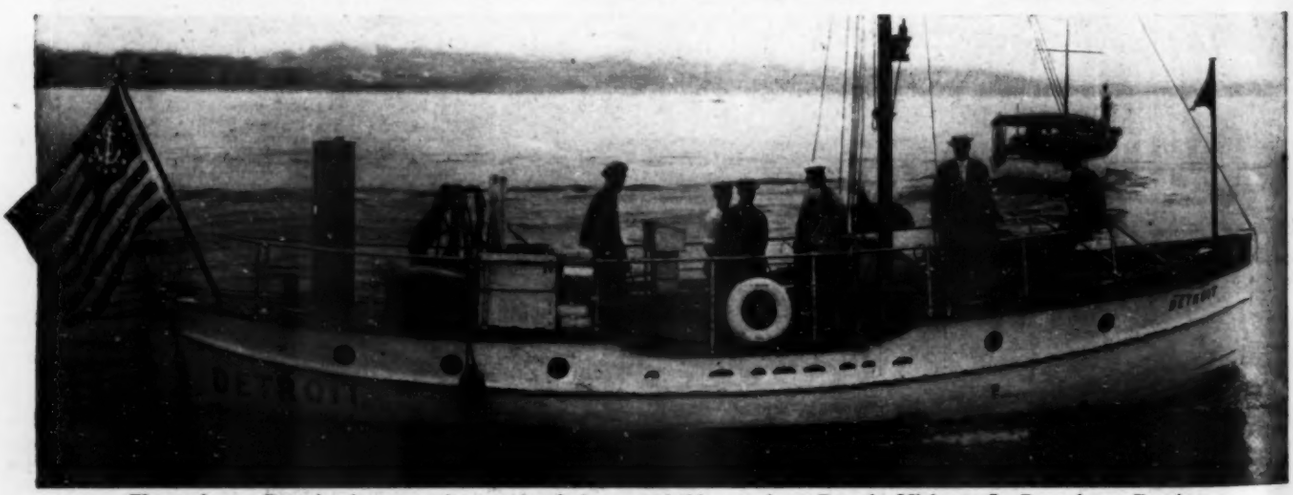
Detroit's engine room with the 16-h.p Scripps that drove her across the Atlantic without a falter.

On the 31st the liner Amerika was sighted and the Detroit asked her for water, but the message was not understood. From midnight August 1st until early on the morning of the 2nd, the Detroit was again hove to, a heavy gale blowing from the east and a big sea running. The 3rd and 4th were favorable, but on the latter day it was discovered that the boat was leaking and she was only kept reasonably dry by constant use of the pump. On the 5th and 6th it blew strongly from the northwest and in addition to heaving to for three hours, the speed had to be greatly reduced. On the 7th, the crew and their boat narrowly missed being blown to pieces. In charging the storage tanks shortly after midnight, some gasoline spilled and caught fire from a spark. After a few agonized minutes, however, the blaze was put out by Moreton with a Pyrene extinguisher.

The 7th was the last day of the voyage and the weary crew of Detroit thankfully hailed the first sight of the Irish coast. Queenstown was reached at 8:30 p. m., where an immense crowd lined the shore to welcome the daring craft. The first to greet Captain Day and his crew was Chas. O'Callaghan, chairman of the Queenstown city council, who welcomed the mariners on behalf of the townspeople. After overhauling, Detroit continued to Southampton and Ostend and so to St. Petersburg.

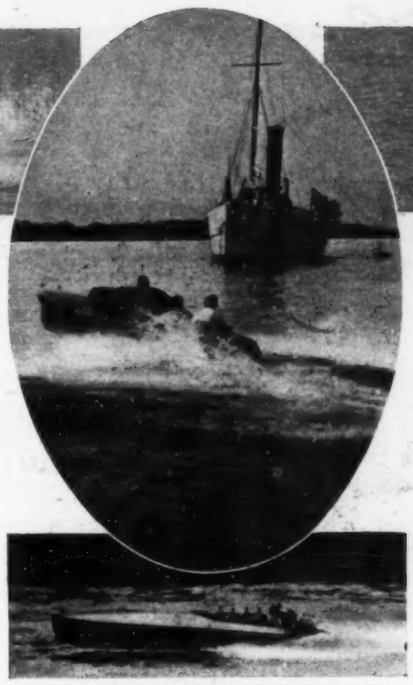
Detroit carried 1200 gallons of fuel and reached Queenstown with about 200 gallons left. Her power plant was a two-cylinder 16 h.p. Scripps, equipped with Bosch ignition Schebler carbureter and a Detroit force feed oiler. She carried a Hyde turbine propeller and a Paragon reverse gear. The motor also had the Perfex ignition system as duplicate ignition. Wolf's Head oil furnished the lubrication and Janney-Steinmetz seamless steel tanks held the fuel. A Dayton 8-light electric lighting

(*Continued on page* 62)



The 35-footer Detroit, that recently completed the remarkable run from Detroit, Mich., to St. Petersburg, Russia.

P. D. Q. II, a Dixie Jr. owned by Mr. A. G. Miles. One of the most consistent performers.



Neptune III, Mr. Buehl's new Hecker hydroplane.

Reliance IV sinking after being capsized by a big swell.

The Racing on the Niagara River.

(*Continued from page* 15)

The races, three of them, one each day, were all over a carefully surveyed course, 5 statute miles around with starting and turning marks permanently fixed. Accuracy of the length of the course can hardly be questioned so carefully had it been layed out and so much in accord with care to details were the entire rest of the arrangements for the meet.

On the last day, in competition for the great Edwin Ross Thomas trophy for the International Interlake Championship, open to boats representing clubs located on the Great Lakes, our familiar friend Baby Reliance II, owned by Commodore J. Stuart Blackton, which has been making such remarkable history all year long at Davenport, Chicago and Huntington, averaged 46.3 statute miles an hour over the 35-mile course, a feat never before attained on the first lap of the last race made the 8.625 miles round at the rate of 46.0 miles per hour, in waters far less favorable than those at Buffalo, waters turned up by movements of many large steamers and yachts and unprotected by an expanse of over 10 miles of open water to the north for a radius of 12 points of the compass, so it appears perfectly reasonable that she should be able to considerably better her Huntington speed. Again, all critics agree that the Thousand Islands course for the American Power Boat Association's Gold Challenge Cup Race is accurate beyond question, and P. D. Q.'s performances at those races and at the Buffalo meet offer valuable data for comparison. At the former meet her best speed for one round of 10 2-3 miles was 37.5 miles per hour and her best average for an entire race of 32 miles was 36.8 miles per hour. Here we find her best lap 38.4 miles per hour and the best average 37.3 miles per hour, not an astonishing increase considering the fact that at Buffalo she was pushed

Table I. Showing Remarkable Speed Made at Buffalo Sept. 12, 13, & 14, 1912

Statute Miles per Hour by Laps of 5 Miles Each.

	FIRST DAY.							SECOND DAY.							THIRD DAY.							
	1st Rd.	2d Rd.	3d Rd.	4th Rd.	5th Rd.	6th Rd.	Average.	1st Rd.	2d Rd.	3d Rd.	4th Rd.	5th Rd.	6th Rd.	Average.	1st Rd.	2d Rd.	3d Rd.	4th Rd.	5th Rd.	6th Rd.	7th Rd.	Average.
Baby Reliance II..	45.4	46.1	46.0	46.0	45.5	45.4	45.7	41.4	41.1	40.3	41.8	42.2	40.7	41.5	44.2	45.5	46.7	46.2	46.9	47.2	47.39	46.3
Baby Reliance III.	43.7	44.1	44.2	44.3	44.4	44.6	44.2	41.2	39.8	39.7	39.9	40.0	36.4	39.4	44.0	42.4	41.0	42.3	41.1	42.3	40.3	41.7
P. D. Q.	35.0	36.4	36.6	37.2	37.0	36.8	36.5	36.1	36.1	37.2	37.4	37.8	37.6	37.0	34.9	37.4	37.8	38.0	38.0	38.4	36.8	37.3
Heloise	36.0	36.7	36.4	36.8	25.5	22.1	32.9	35.8	36.1	37.0	37.0	37.4	37.2	36.6	35.7	37.0	36.7	36.7	37.2	37.4	37.4	35.1
Gretchen III.	41.6	44.0	44.5	44.4	39.5	Withdrew.		Did not start.							Did not start.							
Thelma			Did not start.					33.3	33.8	33.3	34.0	34.9	35.2	33.7	30.7	33.1	34.5	Withdrew.				
Neptune			Did not start.					39.3	40.2	40.6	40.3	40.2	31.8	38.2	43.5	44.1	43.8	42.8	43.5	43.5	42.0	43.2

Table II. Giving Particulars of the Boats, Times Made Each Day and Order of Finishing.

BOAT.	OWNER.	LENGTH.	BUILDER.	DESIGN.	MAKE OF ENGINE.	H.P.	TYPE OF HULL.	ELAPSED TIMES. 1st Day. 30 miles.	2d Day. 30 miles.	3d Day. 35 miles.	POSITIONS. 1st Day.	2d Day.	3d Day.
Baby Reliance II..	J. Stuart Blackton	30	Smith-Ryan Boat Co.	Smith-Ryan Boat Co.	Sterling	150	Single Step	47-35	43-49	45-25	1	1	1
Baby Reliance III.	Mrs. J. S. Blackton	26	Smith-Ryan Boat Co.	Smith-Ryan Boat Co.	Sterling	150	Single Step	40-52	45-50	50-19	2	2	3
P. D. Q.	A. G. Miles	20	Staten Island Shipbuilding Co.	Tams, Lemoine & Crane.	Sterling	45-60	Single Step	49-22	48-42	56-21	3	4	4
Heloise	W. H. Gooderham	26	Saunders	Saunders-Tauber	Wolseley	60	Five Steps	54-40	49-09	57-00	4	5	5
Gretchen III.	J. W. Hubbard	26	Hecker	Hecker	Van Blerck	275	Monoplane	D.N.F.	D.N.S.	D.N.S.	..	..	..
Thelma	Thelma Engine Wks.	26	Lemay	Hecker	Thelma	150	Single Step	D.N.S.	53-18	D.N.F.	..	6	2
Neptune	L. Buehl	26	Hecker	Hecker	Sterling	150	Single Step	D.N.S.	47-11	48-43	..	3	..
Question	H. L. Trebert	20	.....	.....	Trebert	100	Monoplane	D.N.F.	D.N.F.	D.N.S.	..	..	..
Reliance IV.	C. E. Crawford	26	Smith-Ryan	Smith-Ryan	Sterling	150	Single Step	D.N.F.	D.N.F.	D.N.S.	..	..	..
U U IV.	W. A. Wickwire	26	Smith-Ryan	Smith-Ryan	Sterling	150	Single Step	D.N.F.	D.N.F.	D.N.S.	..	..	..

and her best lap of 5 miles—the last—was at the rate of 47.39 statute miles per hour, two world records of competitive speeds.

For those who may tend to doubt the veracity of the above figures some comparison may be of interest: assuming that the Huntington International Race Course was correct, which we think can be done without question, we find that the same boat every inch during the three days for third place by Heloise, a boat of almost equal speed to Mr. Miles' Thousand Islands Champion, and that the Buffalo course is somewhat faster than the other, due to there being less current in the Niagara River at this point than at the St. Lawrence course. A close analysis of Table I giving the speed for each boat in every one of the 19 laps should prove valuable. Also Baby Reliance III, an absolutely new and un-

(*Con. on page* 48)

Gretchen III, with a 12-cylinder Van Blerck engine, met with an unfortunate accident in the first race.

P. D. Q. II and the International Trophy defender Baby Reliance III.

"?," owned by H. L. Trebert.

New Things for Motor Boatmen

A New Disco Starter.

The Ignition Starter Company, of Detroit, has recently brought out a new model of their starter to be known as Model 16, the parts of which are illustrated upon this page.

The distributor of this device is similar to the one used on the original Disco starter and embodies the same principle, the operation, however, differing slightly in the fact that the valve is a needle valve and is opened and closed by means of the handle which is turned to the right and back again instead of making a complete revolution as on the former model. The engine valve as shown is a combination check valve and priming cup, which has the unique feature of being self-cleaning. When the lever is in an upright position the check valve is working and is so placed as to admit the gas from the distributor into the engine. It will not, however, allow any of the engine gases to pass back through the tubing. When the handle of the priming cup is turned to the left a passage is opened past the ball check direct into the engine for priming purposes and by turning it to the right it opens a passage from the engine through the priming cup so that any particles of dirt or carbon may be blown out while the motor is running.

* * *

The Presto Lighter.

The Metal Specialties Manufacturing Company, 736 West Monroe Street, Chicago, are making a combination cigar lighter and trouble lamp known as the Presto, which has been on the market for about six months and which is meeting with a great deal of favor. There are no switches or loose parts with this device and it will operate upon a six-volt storage battery or dry cells. The cost is but $3.50 with 10 feet of silk cord. The cigar lighter is operated by pressing the larger of two buttons upon the cylinder, and as but half an ampere is used in the coil of the lighter it will not cause the batteries to deteriorate rapidly. The cigar lighting part is renewable at small cost and the lamp used is of the regular type. This is lighted by pressing the other small button and it will remain lighted until the button is released. Extra platinum cigar lighter tips may be obtained for 75 cents each and extra incandescent lamps for 25 cents each.

* * *

Gray & Davis Starter.

Gray & Davis, Inc., 55 Landsdowne Street, Boston, Mass., have developed a specially designed electric starter which is unusually efficient in its operation. The complete system includes a starting motor as well as a lighting dynamo and all that is necessary to start the largest engine is the pressure upon a pedal. Each of these two units has its own distinctive function, the mission of the dynamo being to furnish light and current for the battery while the starting motor starts the engine. The starting motor is connected with the flywheel by gears so that when the starting pedal is pressed, this motor turns the engine until it is properly operated, when the motor automatically ceases to operate. This starter is very economical in the use of current. Since the starting motor is disconnected and remains stationary as soon as the engine starts, it requires no extra power for its operation, so that it is in no way a drag on the power plant. It will operate from a six-volt battery. The lighting dynamo which is used in conjunction with the starting motor is small and compact and has a constant speed feature so that the voltage cannot vary. This manufactures current to charge the batteries, light the lamps, and operate the starting motor. The six-volt battery has three cells and occupies but a very small space.

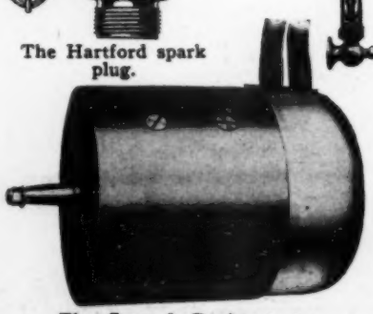
The Disco bulkhead attachment.

The Disco distributer.

The Disco check valve and priming cup.

The Imperial gasoline gauge.

The Hartford spark plug.



The Gray & Davis starter.

Tudor Starter.

John W. Tudor, 35 Congress Street, Boston, Mass., has devised an automatic starter of the spring type, the main portion of which is linked to the engine shaft and rotates with it between bearings. Clutches are used to engage the shaft of the starter with the main shaft of the engine and in connection with these is a power spring mounted on a vertical shaft, the spring being wound automatically by the rotation of the engine after it is started. A foot lever may be provided to operate this starter or it may be operated by a hand lever, as desired. The clutch automatically releases itself as soon as the engine is run under its own power and there is no danger from a back-kick upon the part of the engine.

* * *

Imperial Gasoline Gauge.

The Imperial Fluid Gauge Company, Canton, Ohio, recognizing the value of a gauge that will tell at all times the exact quantity of gasoline in the tank and the rate at which it is being used have devised a type which sells adapted to gravity feed for $6 and for compression feed $7. It is neat and compact in construction and while only 7/8 of an inch in diameter its length is governed by the inside depth of the tank. This gauge can be placed in any number of different positions either in sight or under the deck, but as it is supplied in nickel, brass or black enamel finish, forming an armament for the boat, it is usually placed on the bulkhead. This gauge is provided with an emergency shut-off in case any accident should occur and the indicator and glass tube are so plainly marked that a glance will tell the amount of gasoline in the tank.

* * *

Hartford Spark Plug.

The Hartford Suspension Company, of Jersey City, N. J., who manufacture the Truffault-Hartford shock absorber and the Hartford auto-jack, have just brought out a new product known as the Hartford two-piece spark plug. "Easy to keep clean" is the strong argument advanced for this plug and its construction is quite simple. The lower part of the plug fits into the cylinder head permanently while the upper part is removable. It can be unscrewed and cleared of soot and the design of the plug is intended to overcome the risk of breakage of the porcelain every time the plug is taken apart for cleaning.

* * *

Sun-Lite Gas Producer.

This machine is adapted for searchlights for motor boats, and for gas engine starters, double valves being furnished. A pressure gauge gives the exact condition of the gas supply at a glance, the gas being forced through a filter removing moisture and dust. To generate gas it is necessary only to unscrew a thumb knob and lift a little ball five or ten seconds, giving an air vent for the water. This allows the water to flow through the valve, coming in contact with carbide in basket, generating gas, which passes up through the automatic pressure regulating tube to the bottom of the water in the tank, then bubbling to the surface. As soon as pressure is registered on the gauge the thumb knob is closed. The tank is now gas primed and need not be primed again as long as there is a few pounds pressure indicated on the gauge, even if tank has been used several times or the full capacity of the charge. This device is manufactured by the Sun-Lite Automatic Storage Gas Tank Manufacturing Company, of 25 Bramhall Street, Portland, Me.

Topaz, a 43-Foot Cruiser.

THE power cruiser Topaz was designed and built by F. S. Nock, East Greenwich, R. I., for J. Richmond Fales, of Barrington, R. I., who is the rear commodore of the Barrington Yacht Club. This boat is a typical cruiser of the semi-raised deck type, of which a number have been built at the same yard within the last three years.

In the extreme forepeak there is a chain locker and next aft, a tank supplying water by gravity to sink and lavatory. Aft of the tank is the owner's stateroom with two single berths, two clothes presses, bureau, and ample storage space under the berths for bedding, blankets, pillows, etc. Next aft on the starboard side is a double clothes locker and opposite, a toilet room fitted with a Sands toilet, lavatory, etc. The saloon is fitted with two extension berths, affording ample accommodations for four persons to sleep comfortably. There are also miscellaneous shelves, glass lockers, extension table, etc. At the foot of the companionway there is a locker for spare parts of the engine and tools. Next come lockers for miscellaneous materials and then a refrigerator. On the port side is the galley with the usual equipment of dresser, Shipmate range, kerosene stove, sink, dish lockers, and lockers for cooking utensils. Aft of the galley and extending under the cockpit is a folding berth for the crew.

The interior is finished throughout in cypress with mahogany trim. The upholstery, such as cushions, carpets and window draperies, is of a suitable shade of green. At the after end of saloon as well as at the forward end and at the after end of stateroom, are portieres of heavy velour in place of doors.

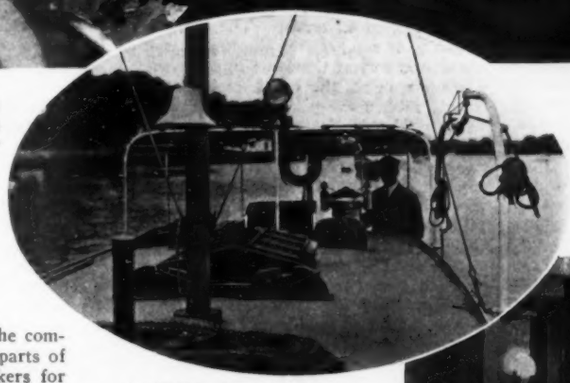
The general finish of the exterior of the boat is of mahogany, top-sides, white.

The power plant is a 4-cylinder, 6½ x 8 in. heavy duty Sterling engine, with bulkhead controls, which will drive the boat at 11 miles. The gasoline tanks are situated under the seats in the cockpit and there is also an auxiliary gas tank under the lazarette. The storage batteries under the lazarette are arranged so as to be easily reached when desired, and should furnish ample lighting power for the entire boat.

The construction of the boat is moderately heavy, but at the same time it does not seem to materially reduce the speed of the boat.

She has been cruising since early in May and at the end of the season will have traveled a good many miles.

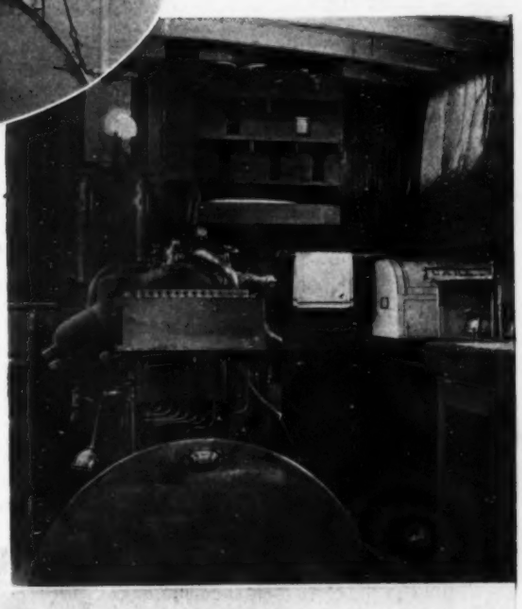
Looking forward into the saloon and owner's stateroom.



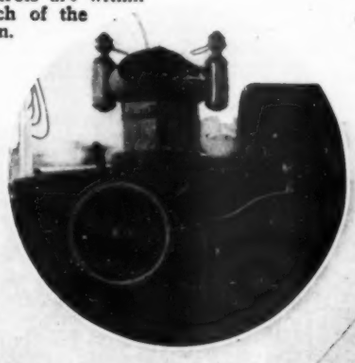
The roomy raised deck.

Length over all.....43 feet
Beam .....10 feet
Draft ..... 3 feet 6 in.
Power plant, 4-cylinder 6½ x 8 inch heavy duty Sterling.
Designer and builder, F. S. Nock, East Greenwich, R. I.
Owner, J. Richmond Fales, Barrington, R. I.

The galley and the heavy duty Sterling.



The controls are within easy reach of the helmsman.



Topaz is strongly built and her heavy-duty Sterling gives her a speed of 11 miles.

From Motor Boating Readers

A Department for the Exchange of Ideas and the Discussion of Questions of General Interest. Editorial Opinion on a Number of Questions Submitted by Readers of the Magazine.

MoToR BoatinG's columns are open to its readers, not only for asking questions, but for placing before other readers ideas, results of experience, opinions, etc., that should be interesting or helpful to them; but the editor will not, of course, be responsible for any opinions expressed or statements made in such communications. The name and address of the writer must necessarily be given in every case to make an answer by mail possible (no anonymous contributions will be considered for publication), but names will be omitted in publishing the letters and answers where desired, in which case it is desirable that initials or other distinguishing signature be appended. Through the correspondence department readers of the magazine may be of direct aid to one another in solving the problems of motor boating.

R.P.M. Necessary to Determine Proper Propeller.

To the Editor of MoToR BoatinG, *Sir:*—

I am taking the liberty of asking for advice. The data concerning the boat is taken from an A.P.B.A. rating card: Length overall, 21 feet 6¾ inches; overhang, f'w'd 2⅛ inches; l.w.l., 21 feet 3¾ inches; overhang, aft, .0⅝ inches; l.w.l. beam, 3 feet 7 inches; beam, 4 feet 2 inches; depth at "C", 8 inches; m. s., 2,388 sq. feet. Engine, Kermath 4 cyl., 4 cycle, bore 3½ inch, stroke 4 inch, h.p. 8.54, rating, 45.72. We are using a 16-20 3-blade architect's wheel and get about twelve miles an hour. The boat has a square bilge with a moderate flare forward.

Will you kindly advise me whether the present wheel is most suitable. If not, what dimensions would you suggest?

L. H. D., Cape May Court House, N. J.

[We are not able to advise you as to the proper wheel for your boat, as you have not given us the revolutions of the engine, which must necessarily be known in determining the proper wheel for any boat. You will see that an 8½ h.p. engine turning at 200 revolutions will require an altogether different wheel than an engine of the same power turning 1000 or more revolutions.

However, off hand, we would say that if you get 12 miles an hour out of your boat, which rates only 45.72 according to the A. P. B. A. Rules, we should think tha you are getting all that you could expect and much greater than the average boat of this rating.]

Two and Four Cycle Explained.

To the Editor of MoToR BoatinG, *Sir:*—

Will you kindly explain the meaning of the word cycle. Has the four-bladed propeller any advantages over the two or three-blade wheel?

G. B. H., Oak Park, Ill.

[The meaning of the word cycle probably can be best illustrated by describing what goes on in the cylinder during one complete series of changes or cycle. In the "two-cycle" type of engine you will see that all of this change occurs during one revolution of the flywheel, which corresponds to one upward and one downward stroke of the piston, hence the term two-cycle or more correctly two-stroke cycle. In the four-stroke cycle type of engine this occurs during two revolutions of the flywheel or four separate strokes of piston, hence four cycle.

The action of the two-stroke cycle is as follows: As the piston moves upward from its lowest position it creates a partial vacuum in the crank case which is necessarily airtight. This vacuum or suction automatically opens the check valve on the carburetor and draws in a supply of fuel into the crank case. This drawing in continues as long as the piston is ascending, but when it reaches the top of the stroke, the suction no longer being present, the check valve closes confining the charge in the base. When the piston moves downward this charge is compressed until the piston uncovers a passage leading from the base to the upper portion of the cylinder. As this is opened the base pressure naturally forces the fuel charge to the top of the cylinder until the mixture in the base and above the piston are at the same pressure, which owing to the design of the ports, etc., occurs at the time the piston is near the bottom of its stroke. The upward stroke then begins compressing the fuel charge above the piston and at the same time drawing in a fresh charge in the crank case as explained above. When the piston has reached the top of its stroke the fuel charge, now under great pressure is ignited by an electric spark, causing a sudden expansion of the gas, or as we say, an explosion, the force of which pushes the piston downward, turning the flywheel, propeller shaft, etc., besides again compressing the new fuel charge drawn into the base by the last upward stroke. As the piston continues downward an exhaust port is opened allowing the burned gases to escape into the air. At the same time that these are escaping a new charge of fuel is being forced in to take their place by the pressure in the crank case, created as explained above. The actual mixing of the old and new gases is prevented by a baffle plate on the top of the piston which in a way divides the space above the piston into two separate chambers, and deflects the incoming gas upward. By following the order of the above changes you will see it requires two complete strokes or one revolution to produce them all.

In the four-stroke cycle type of engine the same changes occur except that it takes four strokes instead of two to complete them; that is, at the time of forcing the gas into the top of the cylinder, no other operation is going on, so to speak. The operation at the four strokes is as follows: 1st, downward stroke, fresh fuel mixture being drawn directly into top of cylinder by suction created; 1st upward stroke, fuel mixture in cylinder being compressed; 2d downward stroke, explosion and expansion of gases giving power; 2d upward, burned gases being forced out of the top of the cylinder; 3rd upward, repetition of 1st upward and so on requiring four strokes again to complete a cycle. The valves or ports on this type are controlled by mechanical means while those on the two-cycle type are operated generally by the piston uncovering the apertures.

The four-blade propeller has no advantage over the two or three-bladed wheels as far as the average size motor boat is required, although it is used considerably on large steamers turning less than 100 revolutions.]

What is a Speed Boat?

To the Editor of MoToR BoatinG, *Sir:*—

Having been a subscriber to your magazine and a reader for four years, receiving valuable information from time to time, I beg of you to help me now. I am a member of the Waucoma Yacht Club. They run a long distance race to Port Jefferson and return to New Haven every August. I took second place in 1910 and second prize in 1911, and now they have ruled me out of 1912 race, rating me as a speed boat. My boat is a Brooks model No. 234, bought knock down and built by their patterns. She is 23 ft. by 5 ft. with a seven horse Bridgeport make and break motor, rated 10 h.p. by A. P. B. A. rules 2-cyl. 2-cycle. The club measured me 21 ft. 8 inches on water line; beam on L. W. L. 51″; draft at section 7.5″; engine 2-cyl. 4½x5; rating 47; Brooks catalogue calls for length 23′, beam 56″. Depth at bow 41″; depth amidships 28″; depth at stern 21″; draft of hull, 10″.

J. H. M., New Haven, Conn.

[As you have not sent us a copy of the conditions governing the competition for the Cup in question, we are afraid we cannot help you out of your difficulty. There is no definition of a speed boat in the A. P. B. A. rule book neither is there any definition of one that we have ever heard of. A speed boat in one's eyes is not such in another's.

Generally, the conditions governing a particular race state the maximum and minimum size of the boats allowed to compete, or sometimes the largest allowed rating. Other restrictions might also be drawn up when the cup is donated such as horse power, crew, equipment, etc., or authority might be given to persons handling the race to draw up their own qualifications so you will see that we cannot decide, not knowing the conditions.

However should the conditions governing the race define a speed boat as one falling in the "Racing Boat" class according to the A. P. B. A. 1911 or 1912 rules, a boat 21′ 8″ long and rating 47 would *not* be a speed boat. However under the 1909 rules the term automobile boat was used and your boat with the above rating would just fall in that class.]

Inland Route to Florida.

To the Editor of MoToR BoatinG, *Sir:*—

Would you kindly inform me what the inland route to Florida is? I have asked several people but cannot get any reliable information.

J. H. W., Hartford, Conn.

[From New York City down the upper and lower bays to Perth Amboy, where the Raratin River is entered and followed to New Brunswick. Here the Delaware and Raratin Canal takes you to Bordentown, N. J., at which point the Delaware River is entered and followed to the entrance of the Delaware and Chesapeake Canal at Delaware City. This latter canal takes you to the head of Chesapeake Bay, which should be followed as far as Norfolk, Va., entering the Canal taking the south branch of the Elizabeth River to Deep Creek and then the Lake Drummond Canal to the Pasquotank River, which is a branch of Albemarle Sound; then across this and Talmico Sounds to Core Sound as far as Beaufort, N. C. From this point it will be necessary to take the outside route to Georgetown, S. C. From Georgetown to Charleston either an inside or outside route may be followed; then by a series of bays, rivers and creeks with a little outside sailing to Savannah, Ga., and thence to Jacksonville, Fla.

The following government charts will give you all the necessary information: Nos. 369, 375, 126, 131 to 137, inclusive; 140, 142, 143, 421, 147 to 154, inclusive; 424, 425 and 155 to 159, inclusive. Chart No. 440 will show you the Savannah River and No. 577 the St. Johns River, up to Jacksonville.]

Pilot Rules and Safety.

To the Editor of MoToR BoatinG, *Sir:*—

A short time ago it was my experience to be in the pilot house of a gas power ferry, running between the mainland and a bathing station some miles out. The Pilot was a licensed one.

The channels were narrow and we passed a number of smaller power boats on the trip. After several had gone by, one clearing us by a dexterous wiggle, I asked the Pilot why he did not give the regulation signals. And he told me that they would not be answered or understood. This he proved by signaling all the boats we passed thereafter.

Wouldn't it lend to the pleasure, as well as the safety of power boating to know a little of the whistle language? The fundamental rules are extremely simple, as the following, which are the Passing Rules abridged will show.

(1) Sail has the right of way over power.

(2) When boats are approaching each other, the boat having the other on her port or left side, has right of way.

(3) When one boat is overtaking another, the overtaking boat must look out for the one overtaken.

(4) One toot of the whistle, given and answered by the other boat, means you are going to pass and leave her on your port or left side.

(5) Two toots if you are going to pass and leave her on your starboard or right side.

(6) In the case of misunderstood signals, or danger of any kind, both boats are to reverse, stop or do the best they can to avert collision, giving several short toots of the whistle. (Not less than four the Rules say.)

(7) Three short toots mean, "My engines are going at full speed astern."

Hoping that the above may help to avert some future accident, and that more boat owners will procure and study the Pilot Rules, I leave you to the Government Publication.

P. J. HEMPSTEAD, New York.

Type of Ignition System.

To the Editor of MoToR BoatinG, *Sir:*—

I am undecided whether to have make or break or jump spark ignition on a 25 h.p. motor, which do you advise, also will a 12-volt system give a greater efficiency. (I mean, of course, as far as reliability of the spark is concerned), than a 6 volt system. Is a three-cylinder motor a smoother running engine than a two or four cylinder?

J. W. L., Victoria, B. C., Canada.

[We would advise the jump spark on an engine of 25 h.p., provided it is under cover, of more than 3 cylinders and designed for over 600 revolutions per minute. If it does not meet all these requirements, the make and break will give as good satisfaction, and as the above standard is departed from, may produce better results. Without further particulars than you gave us, it is impossible for us to advise definitely.

A 12-volt ignition system would require a specially designed coil or ignition plant, and would have little in its favor over the standard 6-volt system. In some cases a three-cylinder engine might be better balanced than a two, but you should give us further particulars of the type, cycle, etc., of each.

Right or Left Wheel?

To the Editor of MoToR BoatinG, *Sir:*—

Would you be good enough to inform me as to whether or not if in connection with a 2-cycle engine a right or left hand wheel may be used indiscriminately on the same engine, and if in each case the same results can be obtained as to propelling power (towing), speed, etc. Of course the hull and engine remain always the same, it is only the wheel that is being changed from a right to a left wheel or vice versa, for sake of experiment.

Jos. A. MARGUES, Mobile, Ala.

[The usual two-cycle engine is designed to run equally well in either direction and in fact in the majority of such installations this fact is depended upon as the only means of reversing, and we see no reasons why you should not obtain equally good results with either a right or left-handed wheel.]

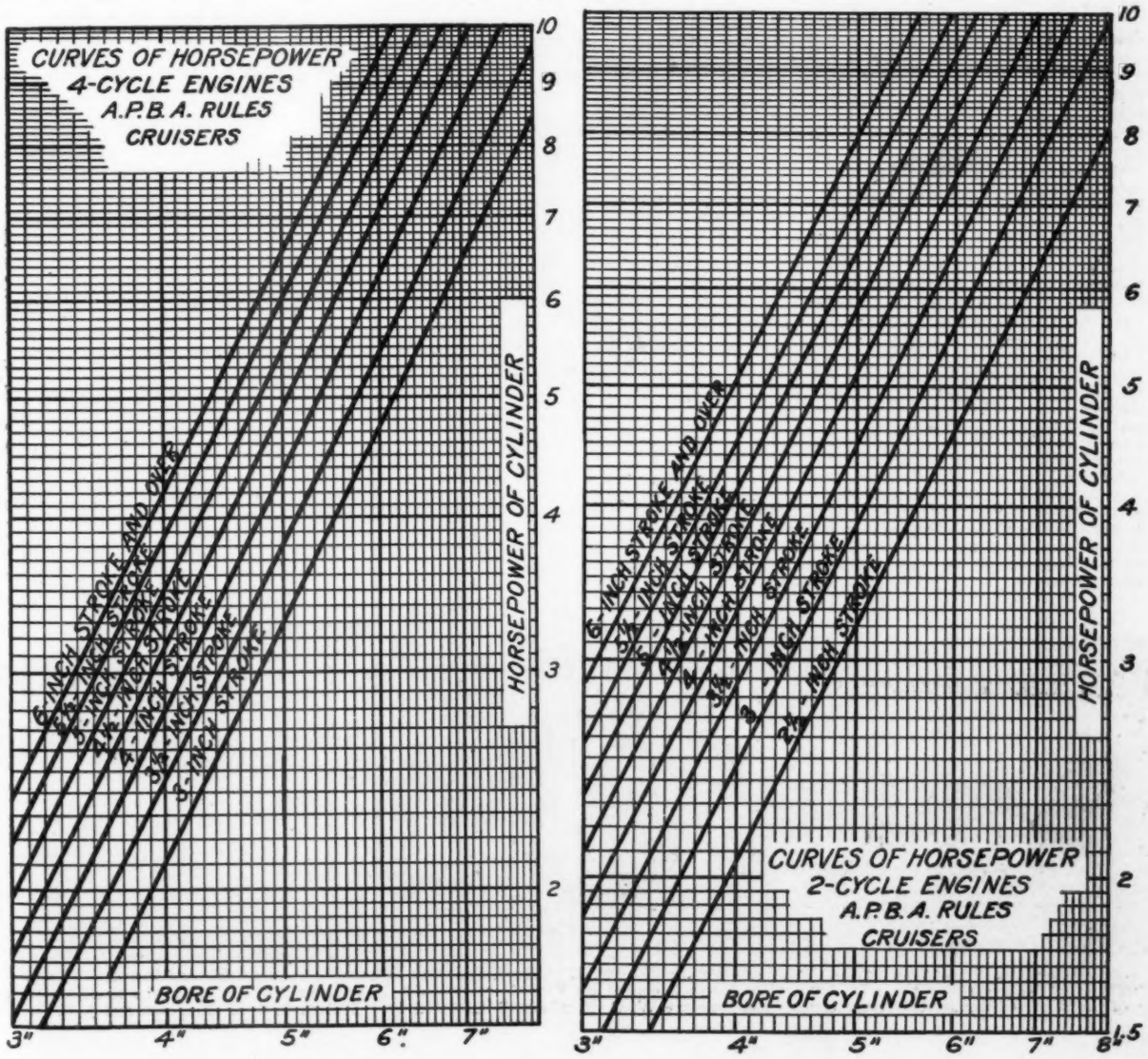
Horse Power of Engines.

To the Editor of MoToR BoatinG, *Sir:*—

Having found the information in your magazine the most reliable of any in the field, I take this opportunity to ask you to inform me of the difference in horsepower rating for racing purposes of engines of 6 inch stroke and having respective bores of four and five inches, both two and four cycle.

T. T. J., Baltimore, Md.

[From the curves shown below the horsepower according to the A. P. B. A. rules, per cylinder of various sizes of engines in cruisers may be read off directly. Should this be desired, for the so-called "racing class" the values should be multiplied by 1.5.]



Among the Clubs

Clubhouse of the Lake Hopatcong Yacht Club, with Dixie, Jr., in the foreground.

Motor Boating at Lake Hopatcong.

About fifty miles from New York, among the hills of northern New Jersey lies Lake Hopatcong, with its wooded shore line eighty miles in length, forming a natural background for its gleaming waters. The lake is nine miles long and about one mile wide and this broad expanse is dotted in places with numerous small islands which not only add to the picturesqueness, but give the boatman the pleasure of conducting miniature expeditions of exploration. Needless to say, such a paradise for the motor boatman has not been neglected and Hopatcong not only has many members of the fraternity, but a thriving club, which has engineered a series of very successful races during the past season. Although the Lake Hopatcong Yacht Club has been in existence for a number of years, it was not until the fall of 1909 that ground was purchased on which to erect a club house. The house itself was built entirely by the subscriptions of the club members. The club has been fortunate in the possession of a large and capable ladies' auxiliary, which has been to a great extent responsible for the taste and completeness with which the home of the club has been furnished. While racing of both motor and sailing craft holds a large place in the activities of the organization, the social side is by no means neglected. A series of musicals have given a great deal of pleasure to the members and helped to make the club the social center of the summer colony scattered along the shores of the lake. Much of the credit for the present strength and success of the club should be given to Ex-Commodore P. B. Bird, who nursed the organization through its early days and created by his strong personality the enthusiasm which has placed it on its present high plane. The officers of the organization, elected at a recent meeting, are: Commodore, W. H. Barron; vice-commodore, G. N. Seger; rear commodore, J. Baker; fleet captain, H. J. Ketcham; fleet surgeon, Dr. Pilcher; secretary, L. Brett; treasurer, G. Reinberg; trustees, R. L. Edwards, E. E. Sargeant, W. H. Douglass, P. B. Bird, E. Epstean, P. Oetting. A list of the winners in the season's motor boat race series is given below.

Class	Date	Boat	Owner
A	July 20	Falcon	G. L. Leonard
B	" "	Chum	J. G. Clark
C	" "	Dollie	K. S. Evans
A	" 27	Dixie Jr.	R. H. Lock
B	" "	Pegasus	Miss H. Tefft
C	" "	Neptune	A. Roberts
A	Aug. 3	Comet	J. E. Osborne
B	" "	Pegasus	Miss H. Tefft
C	" "	Murjam	R. B. Whitehead
A	" 10	Gopher	Miss N. Sargeant
B	" "	Pegasus	Miss H. Tefft
C	" "	Aloha	J. G. Macfadgean
B	" 24	Kal'ua	R. T. Brown

The Races at Toronto.

Toronto has caught the speed fever and fast motor boat racing is now firmly established in the Canadian city. The racing this year at the Canadian National Exhibition was by far the best ever seen in Toronto waters and the interest and excitement was intense. The feature of the meet was the rivalry between Heloise, the Fauber hydroplane owned by W. H. Gooderhams, of Toronto, and the Reliance IV, belonging to C. E. Crawford, of Emlenton, Pa. The handicap events were run in three classes. Boats of over 18 miles raced in class A; between 10 and 18 miles, in class B, and below 10 miles, in class C. Handicapping was on the basis of actual performance less an allowance of 3 per cent. This made the events full of interest for the spectators and resulted in many close finishes, although a number of boats were disqualified for exceeding their time. A summary of the various events is given below.

SEPTEMBER 2nd, MONDAY.

MILE TRIALS.

Heloise, 1:41⅗. Reliance IV, 1:47. Gadfly III, 2:30.

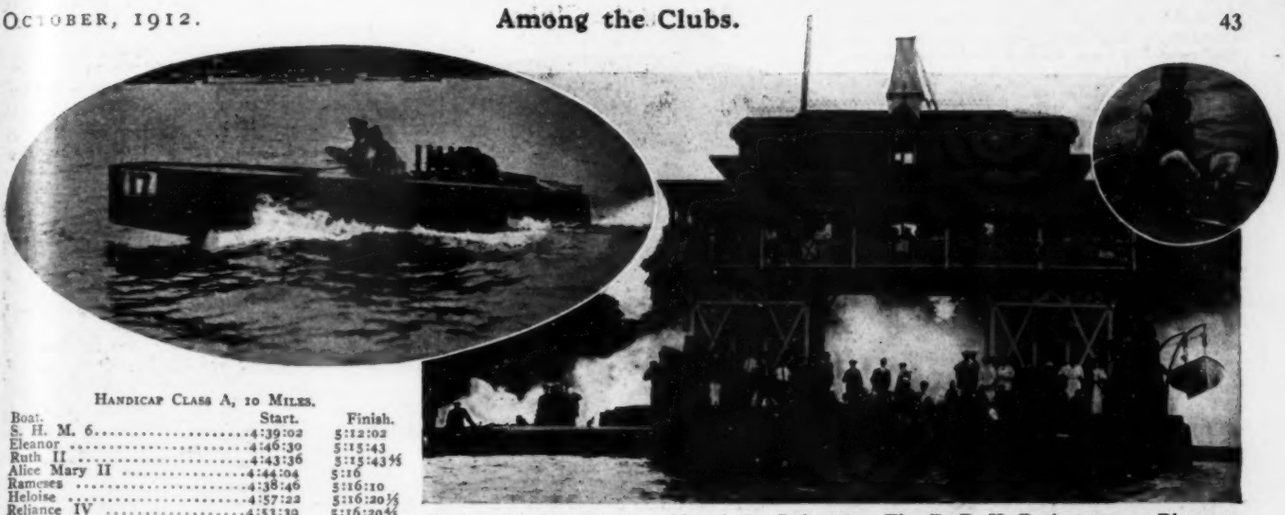
TUESDAY.

HANDICAP, CLASS B, 10 MILES.

Boat.	Start.	Finish.
Scionda	3:42	4:26
F. K.	3:41:20	4:26:04

Letter B. S. H. M. II, Lady Grace and Miss Hasty finished in the order named, but were all disqualified.

Lake Hopatcong motor boating. At the left, Commodore W. H. Barron and Mrs. Barron in the speedy runabout San Toy II. The right hand picture shows the trim day cruiser Corsack owned by Vice-Commodore E. E. Sargeant. The group in the circle are members of the regatta committee. From left to right they are W. O. Knudsen, B. C. Tefft, H. J. Ketcham, S. H. Sargeant and J. F. Runyon.



Racing for the championship of the Delaware. The D. R. Y. R. A. races at Riverton, N. J., on August 31st. At the left, Al-Par-Nel Jr., the winner, passing the committee boat on the first lap with Commodore Smith at the wheel and Albert Smith at the engine. At the right, the Riverton Yacht Club with the smoke from the motors of the racing boats in the background. The insert shows Albert P. Smith in racing rig on the stern of Al-Par-Nel Jr.

HANDICAP CLASS A, 10 MILES.

Boat.	Start.	Finish.
S. H. M. 6	4:39:02	5:12:02
Eleanor	4:46:39	5:15:43
Ruth II	4:43:36	5:15:43⅗
Alice Mary II	4:44:04	5:16
Rameses	4:38:46	5:16:10
Heloise	4:57:22	5:16:20⅖
Reliance IV	4:53:39	5:16:20⅗
Gadfly III	4:48:28	5:23:30
Mar	4:42:38	5:17:25

S. H. M. 6, Eleanor and Ruth II were disqualified, so the first three places went to Alice Mary II, Rameses and Heloise in the order named.

WEDNESDAY.

INTERNATIONAL HANDICAP, CLASS A, 15 MILES.

Boat.	Start.	Finish.
Gadfly III	5:41:23	6:21:54⅖
S. H. M. 6	5:32:27	6:22:00
Ruth II	5:34:17	6:22:39⅗
Eleanor	5:39:03	6:23:05
Heloise	5:54:18	6:24:21⅗

Gadfly III was disqualified.

THURSDAY.

HANDICAP, CLASS C, 15 MILES.

Boat.	Start.	Finish.
Daisy	1:12:18	1:51:09
Bonitiva	1:10:07	1:51:16
Florence (cruiser)	1:00:00	1:52:03
Florence	1:25:26	1:52:22

Daisy was disqualified.

HANDICAP, CLASS C, 5 MILES. POSTPONED FROM MONDAY.

Boat.	Start.	Finish.
Addie	4:51:32	5:21:08
Bonitiva	4:40:07	5:21:21
Beryl	4:41:58	5:21:35
Premier	4:41:38	5:21:37

Addie was disqualified. Daisy, Florence and Wanda did not finish.

HANDICAP, CLASS B, 10 MILES.

Boat.	Start.	Finish.
Letter B	2:36:43	3:25:20
Scionda	2:42:00	3:25:32
Lone Star	2:32:32	3:25:49
Miss Hasty	2:41:06	3:26:30

F. K. Did not finish.

HANDICAP, CLASS A, 10 MILES.

Boat.	Start.	Finish.
Ruth II	3:43:40	4:15:38
S. H. M. 6	3:42:48	4:15:38⅖
Marjorie	3:41:10	4:15:58
Rameses	3:38:46	4:17:46

Ruth II and S. H. M. 6 were both disqualified.

OPEN RACE FOR DISPLACEMENT BOATS, 15 MILES.

Boat, owner and club.	Time.
Gadfly III, H. Greening, R. H. Y. C.	40:34
Eleanor, S. McLaughlin, Ottawa	42:54
Ruth II, F. H. Gooch, T. M. B. C.	47:40
Alice Mary II, F. and D. Houston, T. M. B. C.	47:58

In the Canadian National Championship open race over a course 20 miles long, W. H. Gooderham's Heloise carried off the first prize, with F. H. Gooch's Ruth II second, and A. G. Penman's Marjorie third. The races were handled by officials of the Toronto Motor Boat Club. The starters were J. P. Beatty and S. Sylvester. Handicappers, C. Jenkins and S. Harris.

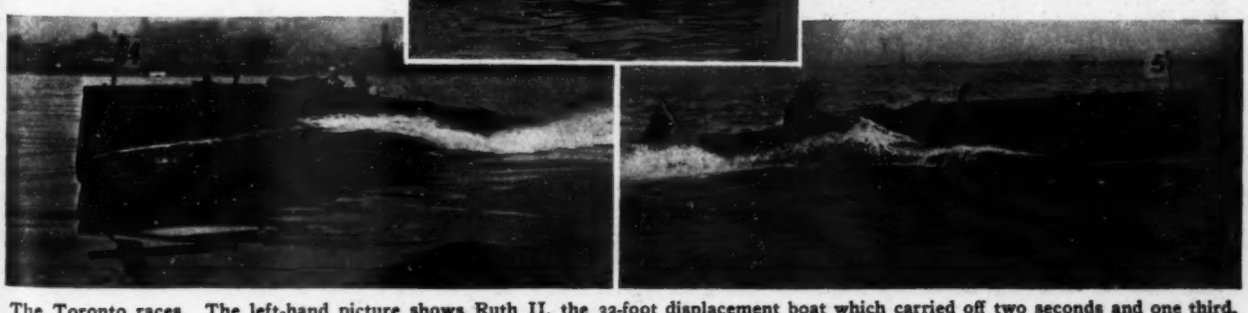
Albany Club Opens New Home.

The opening of the new thirty-five thousand dollar clubhouse of the Albany Yacht Club on Labor Day marked one of the important events of the motor boating season on the Hudson river. It is not only one of the most costly, but also one of the handsomest buildings

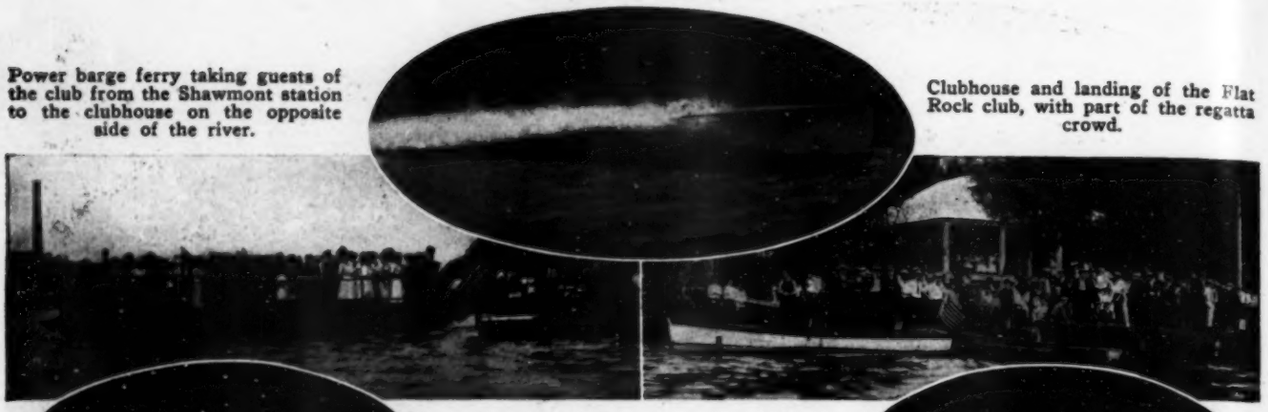
Commodore Matt McCarty, of the Albany Yacht Club.

erected for the exclusive use of a yachting organization in this part of the country. The Albany Yacht Club has been in continuous existence for forty years and has always stood well in matters of finance and membership. The cornerstone of the new house was laid by the present commodore of the club, Matt McCarty, early last fall, and the feature of the ceremony was the presence of Samuel Payn, Jr., the first commodore and one of the organizers of the club. The ground floor of the new building contains the heating plant, refrigerators and coal bunkers and also racks for canoes, dinghys and other small craft. The first floor, entered by a flight of concrete steps and a handsome colonial porch, has the offices, storerooms, stewards' quarters and facilities for bathing. The second floor is largely taken up by the ballroom, forty by seventy feet, with balconies on three sides, reached through long French windows. On the top floor are the grill and general meeting rooms as well as the kitchen. A significant fact in regard to the financing of the clubhouse which illustrates at the same time the loyalty and stick-togetherness of the members, is that not one cent of the $40,000 raised to build and equip the club-home had to be obtained outside. A regatta was held to celebrate the opening of the club.

The class A race over a 20-mile course for displacement boats over 22 miles per hour, was won easily by Elmer L, the scratch boat, with an elapsed time of 47:09. The event for displacement boats under 22 miles and over 16 miles went to Comet III, with Lemon second, and Horace G third. The course was 10 miles and the winner's elapsed and corrected times were 29:12 and 21:06 respectively. The ten-mile race for class C boats—cabin cruisers rating over 40—drew a large number of entries. The event went to Spindrift in 1:05:55 elapsed and 58:33 corrected time, with Widgeon II second and Buster M third. The five-mile contest for cabin boats rating under 40 was won by Thendara, with Rexall second and Wanderlust third. Open boats of from 10 to 16 miles per hour raced over a 10-mile course. Daisy III, the scratch boat, carried off the first prize with an elapsed time of 40:40, while Mary B took second place and Thistle came in third. A five-mile race for open boats under 10 miles per hour went to Helen K, with Hamilton and Lassie second and third respectively on time, but the event was protested, with the result that Florence H was given first place and Kathryn second. A 20-mile free-for-all brought three entries and was won by Elmer L in 47:17.



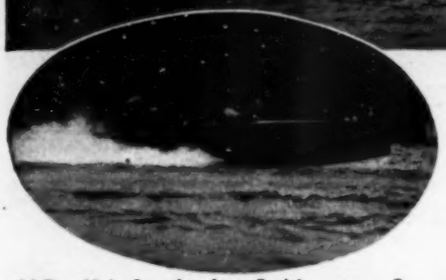
The Toronto races. The left-hand picture shows Ruth II, the 32-foot displacement boat which carried off two seconds and one third. On the right is the racer S. H. M. 6 and above is seen Reliance IV, which was afterwards sunk at Buffalo.



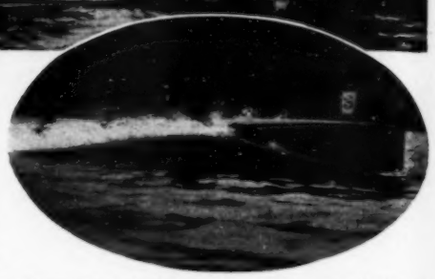
Power barge ferry taking guests of the club from the Shawmont station to the clubhouse on the opposite side of the river.

Clubhouse and landing of the Flat Rock club, with part of the regatta crowd.

Commodore's Day races at the Flat Rock Motor Boat Club, Shawmont, Pa. In the upper oval is seen a typical view of Xqqme, one of the winners, at top speed.



Al-Par-Nel, Jr., the fast Smith entry. In the stern is Lee Templeton, the mechanic, who was thrown out as the boat made the upper turn.



Vera II took third place in the speed class.

The Cleveland Powerboat Club's long distance race from Gordon park, Cleveland, Ohio, to Put-in-Bay and return, a distance of approximately 135 miles, was won by Tramp, Paul Erdman's thirty-five footer, in 17 hours 44 minutes and 29 seconds. The race began Saturday night, August 24th. Swastika got off first at 8 o'clock, but only got as far as Vermilion, where she went out of the race with ignition trouble. The second boat to cross the line was Phylis, the winner of last year's race. She started at about 10.12 and was followed by W. J. Gordon at 12.36 a. m. Sunday morning. Tramp was the last boat to get away, responding to the starting gun at a little after 3.15 a. m. W. J. Gordon overhauled Phylis on the way up the shore and both boats reported at Put-in-Bay before noon on Sunday. Tramp arrived at 12.12 p. m. and at once took up the chase on the homeward leg. She overhauled Phylis off Marblehead and at Vermilion had W. J. Gordon on her beam, and crossed the finish line at about 8 o'clock a winner by two good hours. W. J. Gordon came in about 10 p. m. and Phylis finished an hour and a half later. On the outward leg a strong southwest wind made bad going and in smashing through the head seas, Tramp opened a seam which let in enough water to keep two men busy until the leak could be caulked with waste. In spite of the water, however, her engine ran smoothly for the entire distance. While waiting for the cruisers to finish, three races for open boats and speed craft were run over the Gordon park course. In the under twenty-foot class, Rein, owned by Robert Ehrig, won easily in a field of four entries. R. Drew's Mildred II took second and Sylvia II, owned by M. J. Dietz, came in third. The race for boats over twenty feet long went to H. Harvey's Loafer, with A. Mueller's Alvin C second and W. R. Hart's Topsy third. Cleo II, owned by R. W. Roth, won the speed boat race, defeating Echo II, owned by W. Thewes, by five seconds. G. Dietz's Traveler had trouble and went out on the first leg.

* * *

The Monona Boat Club, of Madison, Wis., held its first championship race on the waters of Lake Monona on August 25th. Pronto, owned by Ray S. Owens, proved the speediest of the fifteen boats which crossed the starting line, covering the twenty-mile course in 1:54:25, with A. H. Thorpe's Letter B, second. The boats were started in the order of their handicaps and though some doubts were expressed before the race as to whether the contestants would be able to stand the grind of four times around the five-mile course, only two entries were forced to retire from the race, both suffering from engine trouble. Fifteen prizes in all have been offered for the championship series, including a big silver cup presented by the Averbeck Jewelry Company to be known as the Averbeck trophy, and awarded to the boat making the best speed in the series and three silver cups for the winners in each of the three classes, which were donated by F. A. Bridge. The Monona Motor Boat Club is a new organization and a live one, to judge from the promptness with which they have gotten into the racing game. The roll contains over 35 names, including some of the most enthusiastic motor boatmen of Madison. The officers are: Commodore, Frank H. Weston; vice-commodore, Gustave A. Benson; rear commodore, Paul Karberg; secretary, Albert H. Thorpe; treasurer, Carl L. Stark; fleet captain, Earl G. Peterson.

Commodore J. Stuart Blackton, of the Atlantic Yacht Club. Commodore Blackton will contribute an article on the racing situation to the next issue of MoToR BoatinG

* * *

The East Greenwich Yacht Club, East Greenwich, R. I., celebrated its third anniversary and "ladies' day" with a regatta on August 17th. All told, seventeen or eighteen different clubs responded to the invitations to be present issued by the East Greenwich organization, most of the local yachtsmen making club runs to East Greenwich harbor, and it was estimated that considerably over three hundred craft of different sizes and types gathered in the harbor on the stated day. There were several races for sailing craft and classes for motor boats of the speed and cruising types. Only four boats started in the speed class and one of these was disabled before the finish. There were twelve entries in the cruiser class, the race being run by starting the boats off together to go around a designated course and at the firing of a day bomb each boat to turn and race back to the starting point from wherever she might be. The contestants thus made their own handicaps. The other water sports included canoe races, swimming races, tub races, tilting matches in canoes, tip-over races in canoes and cutter races. The converted yacht Aileen, Commander Wm. C. Bliss, steamed into the harbor towing the big cutters from the Naval Battalion. These boats made an excellent showing in their races, the cup going to the First District of Providence. In the evening the boats were furnished with colored fire which was lighted at a given signal. This in addition to the illuminated decorations on some of the boats

The Ocean City Yacht Club during the regatta held to celebrate the opening of the new club house on August 24th. The insert shows Commodore Wilson.

made a very brilliant effect, lighting the harbor from end to end. After the firing of a bomb at nine o'clock the fireworks were started on the shore opposite the clubhouse. When the last of these had gone up in a blaze of glory, the yachtsmen repaired to the clubhouse where refreshments were served. Music was furnished by the First District Coast Artillery band, R. I. N. G., during the afternoon and evening.

* * *

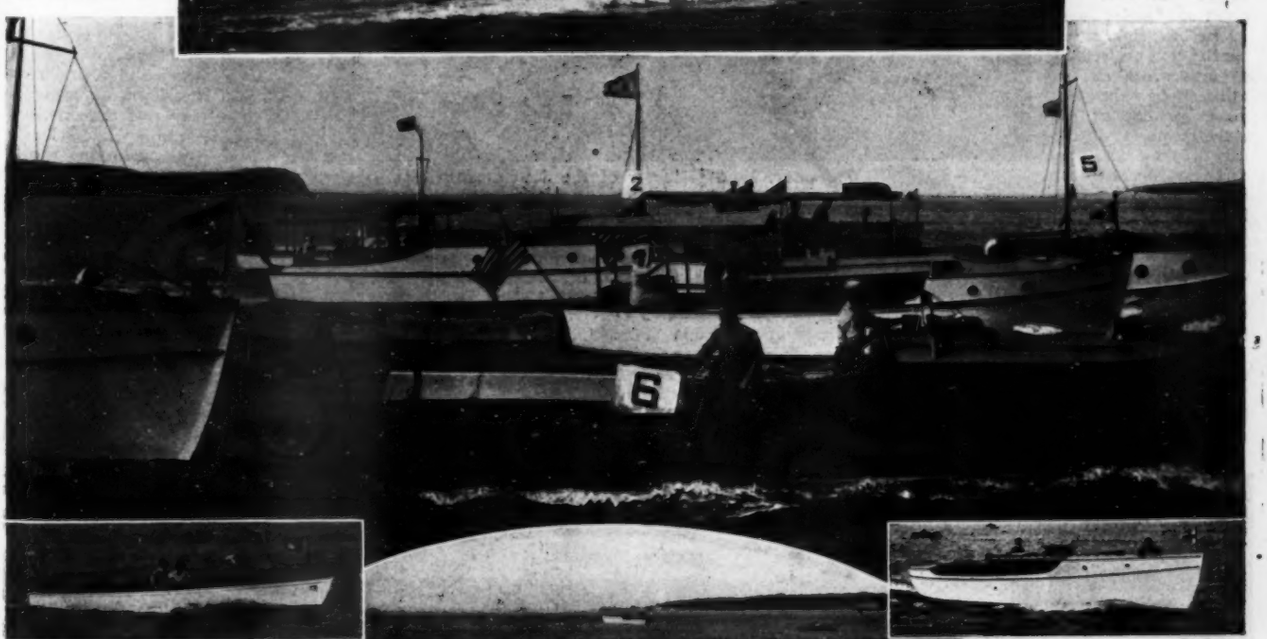
The Ocean City Yacht Club, Ocean City, N. J., conducted the last of the South Jersey Yacht Racing Association series of motor boat races very successfully on August 24th. The occasion was also in the nature of a celebration of the opening of the handsome new clubhouse of the local organization at Ocean City Gardens. The festivities attending the dedication of the new house and the close of the South Jersey season began on the preceding evening when the Ocean City Yacht Club threw open its new home to the inspection of the yachting fraternity. The races were started promptly at 2 o'clock on the afternoon of the 24th and each event contained a large and representative list of entries. Before the start of the regular program, races were held for cat boats and for the mosquito class of sailing craft. The former went to Commodore S. W. Wood's Ben McChree and the latter to Irene II. In the hydroplane class for motor boats the Chelsea Special upheld her reputation established earlier in the season and captured the race from a field of 5 entries, covering the 18.3 nautical miles of the course in 42 minutes and 13 seconds elapsed time or 38 minutes corrected time. Aside from the hydroplanes the interest of the day was centered in the cabin cruisers. There were 11 starters in the two classes. Among the larger boats it was "commodore's day." Commodore J. D. Swoyer of the Chelsea Yacht Club took first with Quaker and Commodore Starr of the Cape May Yacht and Country Club captured second prize with Cora II. The winner's time over the 12-knot course was 1 hour 12 minutes and 33 seconds. There were 8 starters in the small cruiser class. Joseph Shellenberg's Mirna took first place with a time of 1 hour 31 minutes and 47 seconds, the second prize going to Larkspur, owned by John Locie of Island Heights. In the speed boat class Intrepid II, owned by W. Somers of the Seaside Club crossed the finishing line first with an elapsed and corrected time of 1 hour 37 minutes and 14 seconds for the course of 18.3 nautical miles. Vasey, owned by F. Nelson of the Ocean City Yacht Club, took second with an elapsed time of 1:42:01 and a corrected time of 1:37:52. She was penalized 1:45 for starting ahead of her time. The semi-speed boat class went to Geo. F. Joly's Venice of the Atlantic City Motor Boat Club which covered the 12⅓-nautical-mile course in 41:38 corrected time, defeating J. Farrell's Niblink of the Ocean City Motor Boat Club, whose time was 59:49. The small open boat race for a distance of 6.1 nautical miles, was won by Lou Ed, owned by W. F. Fox of Sea Isle, with Annie E. owned by E. F. English of Holly Beach second, and Toy Yot, owned by E. C. Leedom of the Ocean City Motor Boat Club third. The winner's elapsed time was 57 minutes and her corrected time 40:33. There were four entries in the larger open boat class, Cinderella II, owned by E. C. Carpenter of the home club taking first prize. This boat covered the course of 12⅓ nautical miles in 1:29:47 elapsed time and 1:23:07 corrected time. Phyllis, the Cape May boat owned by W. C. Casselman, took second and T. W. Cotting's Sweetheart of Camden, third.

$150 Silver Lake Weir Yacht Club trophy, offered by Commodore W. R. Goodwin at the Chicago Water Carnival, August 10th to 20th. The trophy was awarded to Miss Ethel Salisbury, Muscatine, Ia., winner of the invitation race for ladies in the speed boat Ethel IV.

* * *

The Pistakee Yacht Club, Pistakee Lake, Ill., has announced the following awards of trophy cups for the season's motor boat races: Class A—first, R. A. Bentley trophy, won by Dr. Krueger with the boat Krueger; second P. Y. C. trophy, won by Adam Weckler with Catharine. Class B—L. C. Harring trophy, won by S. Blodgett with Three Boys on July 4th; Judge John C. Owen's trophy won by Miller Bros. with Sentinel on Labor Day. Speed boats only, distance 14 miles. Geo. J. Jaeger trophy, won by Miller Bros. with Sentinel. Family boats, distance 7 miles. Garvin trophy, won by Commodore Carson with Nathalia C. Venetian Night trophies presented by Commodore Chas. E. Carson. Trophy for the best decorated boat awarded to S. Blodgett with Three Boys. Trophy for the best decorated grounds awarded to the Edelmann and Wilson cottage, "Sleepy Hollow." The following cups have been presented to the club, but were not raced for this year. They will be awarded during the season of 1913. Geo. Hofmann, H. T. McNichols and James

The racing boats get away. From left to right, Grizzly Bear, Gunfire, Jr., and Avanti.



Cygnet, owned by H. E. Ficker, which took first in the open boat class.

Adelaide, one of the large cruisers, owned by H. C. Cushing.

Scenes at the regatta of the Huntington Yacht Club held at Huntington Harbor, L. I. In the lower oval, Big Balaam (in the foreground) and Ran. The large picture shows the cruisers starting off.

Mraz. In addition to the above the following cups have already been promised for motor boat races next year. Oak Park Hotel trophy, presented by Joseph J. Mertes; Miller Bros. trophy, presented by O. C. and E. M. Miller.

The Bayside Yacht Club held its fourth annual cruise during August, starting with a run to Sea Cliff, L. I., where the evening was spent watching the illumination of the New York Yacht Club fleet of nearly 100 craft, anchored in the harbor below the Bayside squadron. On the following day the Bayside Club saw the New Yorkers off on their annual cruise and then held races of its own and finished out the day with visiting among the boats. Next morning came a run to Oyster Bay with a heavy wind and high seas and the following day's run across the sound to Stamford, Conn., was made through water which was almost the limit of roughness for the racing boats. In the evening came a dinner at the Stamford Yacht Club made merry by songs and speeches and the awarding of prizes. This was followed by a dance. Sunday morning dawned clear but calm and so the motor boats took the sailing craft in tow and carried them up to Sands Point. An unfortunate incident as the fleet was leaving Stamford, was the burning of the 25-foot auxiliary cat Henrietta, owned by Mr. Purcell.

Commodore Blackton on Motor Boat Racing.

Commodore J. Stuart Blackton of the Atlantic Yacht Club, the most experienced racing boat owner and driver in the country, a man who knows from actual experience and observation what is lacking in the racing game today and the requirements necessary for its ultimate success, will write an article for the November issue of MoToR BoatinG on this timely subject which will be the best and most authoritative of any that has ever appeared in print.

An Ideal 36-Footer.

A Handsome Cruiser with Good Speed and Unusually Roomy Quarters for a Boat of Her Dimensions.

TO meet the demand for a thoroughly comfortable small cruiser which will at the same time be staunch and seaworthy, the Electric Launch Company, of Bayonne, N. J., have developed the 36-footer illustrated on this page. Her principal dimensions are 36 feet overall length, 8 feet 8 inches beam, and 2 feet 4 inches draught. The engine is placed just forward of amidships and is readily accessible through a hatchway.

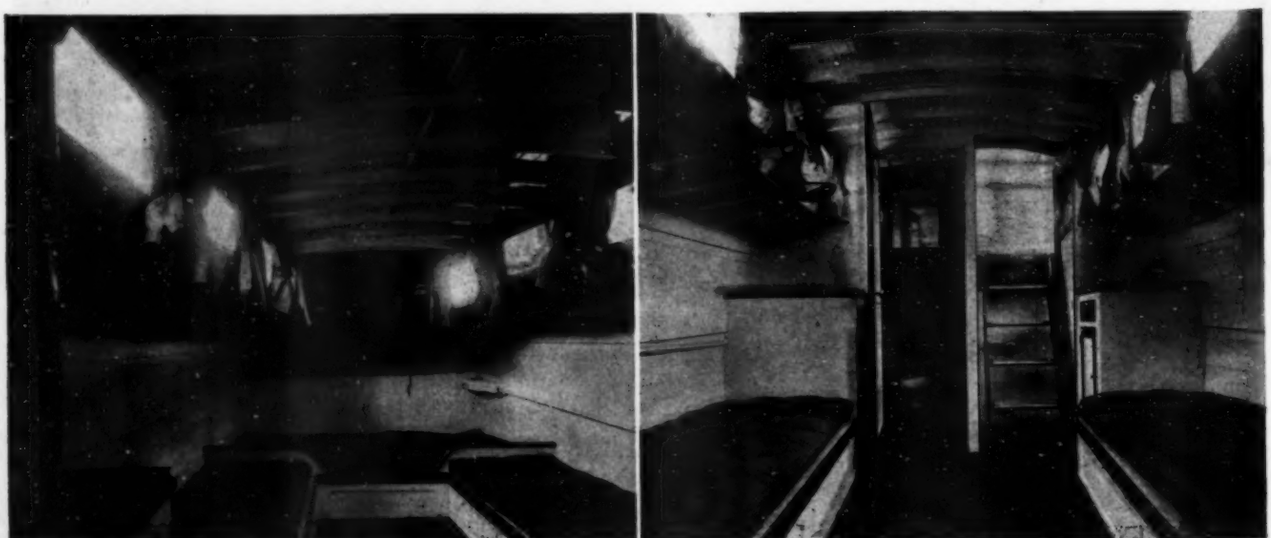
The smart Elco 36-footer of the double-cabin type.

The forward quarters under the raised deck are reached through a sliding hatch. Here are located the galley with its ice box, sink, stove, bench, etc., as well as a berth which can be utilized by the engineer or one of the male members of the party if the owner prefers to operate the boat himself. The large ports and hatch provide abundant light and ventilation. The raised cockpit or bridge deck amidships is 8 feet 6 inches long and the full width of the boat. A lazy seat extends across the after end which, in conjunction with chairs, makes this part of the boat a favorite spot in the daytime.

The owner's quarters aft are reached through a companionway with a sliding hatch. These quarters are unusually spacious for a boat of this size. The cabin trunk gives six full feet of headroom and is lighted by five hinged windows on each side. On each side of the cabin is located a wide transom berth with a double berth aft providing sleeping accommodations for four persons. Underneath the berths are drawers and lockers. There are in addition buffet lockers on each side of the cabin and a full length locker is under the companionway. The lavatory located on the port side, is fully enclosed and equipped with the usual fixtures. The cabin trunk is of convenient height to form a seat thus materially adding to the deck room of the boat and making the whole of the after part available for a large party for day cruising.

The boat is very strongly and substantially constructed with white oak frames, stringers, clamps and shelves of long leaf yellow pine, and planking of southern cedar copper fastened and riveted over copper burrs. Especial care is given to the installation of the engine beds which are of white oak with suitable thwartship braces. The forward quarters are finished inside in white enamel. The trunk cabin aft, including the entrance hatch, windows and forward and after bulkheads, is of mahogany and the interior finish is white enamel with mahogany trim. The boat has a 50 gallon fresh water tank located forward and feeding by gravity.

The power plant is a four-cylinder 30-40 h.p. Elco which gives a speed of about 12 miles per hour. Spark and throttle controls and reverse lever are all within easy reach of the man at the wheel. The fuel is caried in two seamless steel tanks located under the cockpit deck and having a total capacity of 100 gallons. The boat has complete equipment including running lights, 50-lb. anchor, life belts, fire extinguisher, flag poles, flags, fenders, fog bell, cushions, etc.

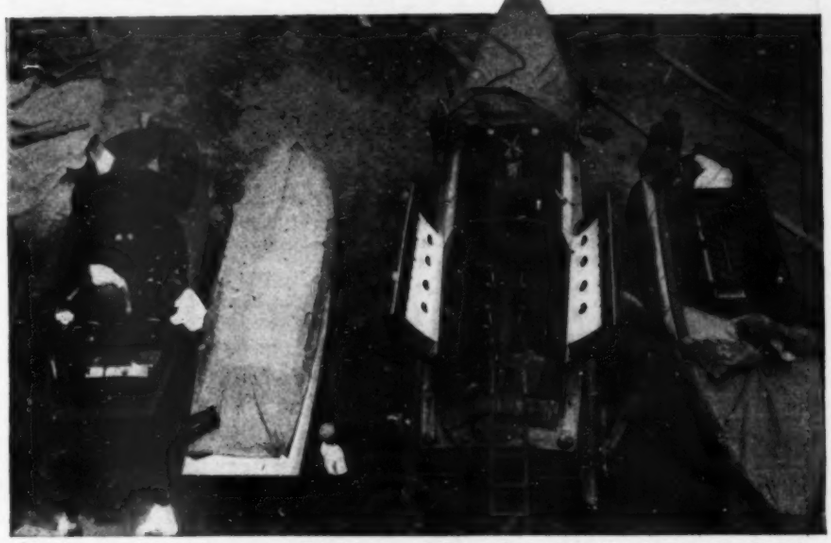


A good idea of her unusually ample accommodations is given by these two pictures of the owner's quarters. The large windows in the cabin trunk give ample light and ventilation.

YARD AND SHOP

Gray Has Brilliant Prospects for 1913.

The fact that the Gray Motor Co. of Detroit, Mich., received more orders for marine engines during 1912 than ever before in the same period of time and that the stationary engine business has almost doubled, and the fact that there is a splendid outlook for a big 1913 business, has lead the company to acquire a large addition to their present plant by leasing another factory building adjacent to the one now occupied by them. The new building is 200 x 50 feet and is built of steel and concrete, with a monitor roof, affording ample light. Orders have been placed for new machinery, so that with the additional floor space and equipment, the production of the company will be increased by more than 30 per cent. Purchase orders have been placed for a great deal of raw material for next year's output, and the factory will shortly begin working to the limit of production in order to have a large quantity of engines in stock for the 1913 season. Speaking of trade conditions during the present year, O. J. Mulford, president of the Gray Motor Co., said that his company's orders for marine engines had exceeded the number received during the same period last year by more than 10 per cent, and that the stationary engine business had almost doubled. In his opinion, motor boating is "coming back," due partly to the elimination of some of the cheap motor cars and partly to a reaction among the masses who had become motor mad. The desire for a clean, cheap, safe and healthful pleasure is growing strong and the dustless and tireless advantages of motor boating are calling back many whose allegiance has been diverted to other pleasures. Several months ago Mr. Mulford negotiated a deal whereby he and the men who have been associated with him for years in the management of the business, purchased the entire Gray Motor Co., and dissevered it completely from the United States Motor Co.



A bird's-eye view of Saracen, Ankle Deep and Peter Pan V at Huntington, L. I., taken from the top of Atkin-Wheeler's derrick at a great sacrifice of editorial dignity.

Dates Set for 1913 Boston Show.

The tenth annual motor boat and engine show at Boston, Mass., will be held in the Mechanics building from February 1st to 8th, inclusive, 1913. Judging from last year, manufacturers who want to exhibit would do well to get their applications in early as the space at the disposal of the management is limited. The show will be held as in former years under the auspices of the New England Engine and Boat Association and Chester I. Campbell, 5 Park square, Boston, Mass., will again be manager. In this issue is given a diagram showing how the space is laid out.

Vortkamp Now with Mayer Carburetor.

H. F. Vortkamp, formerly general manager of the Candler Radiator Company of Detroit, Mich., has been made sales manager of the Mayer Carburetor Company of Buffalo, N. Y. He will make his headquarters in Detroit.

Durkee Expanding.

C. D. Durkee & Co., of 2 and 3 South street, New York City, whose line of marine hardware and boat fittings is known wherever there is water enough to float a motor boat, some time ago started a new factory building on property purchased at Grasmere in the Borough of Richmond, New York City. In order to increase this plant and generally enlarge their manufacturing capacity, the company are offering a limited amount of their 7% cumulative preferred stock, guaranteed by assets of over three to one. The company will be glad to furnish full information to those interested.

Fisher & Allison Buy Interest in Esterline.

The purchase has been announced of one half of the $250,000 capital stock of the Esterline Company of LaFayette, Ind., by Carl G. Fisher and J. A. Allison, who hold the chief control in both the Prest-O-Lite Company and the Indianapolis Motor Speedway. The plant of the Esterline Company will be moved to Speedway, the new "horseless city" recently started by Fisher and Allison near Indianapolis, Ind. It is said that there will be no change in the management of the company. The company has booked orders for the Berdon electric lighting system aggregating, it is said, more than $1,000,000. It is also understood that the Esterline people are perfecting a combined electric starting and lighting system which will be in many respects a radical departure from the electric starting devices now on the market.

Cleveland Firm Gets Foreign Agent.

An indication of the increasing interest in motor boating in foreign countries is shown by the recent connection made by the Cleveland Auto Boat Mfg. Company of Cleveland, Ohio, with a large importing house in Sicily to handle their product throughout the entire island. The first shipment has already been made. A sample line of Autocraft boats was shown in the exhibition held in Halifax during September.

Bosch Ignition at Huntington Bay.

During the elimination trails for the British International trophy held at Huntington Bay, L. I., in the latter part of August, it developed that all of the American competitors but one were equipped with a Bosch magneto and all but two had Bosch spark plugs. The boats having Bosch magnetos and plugs were Ace III, Ankle Deep, Baby Reliance II, Baby Reliance III, Baby Reliance IV, Big Bug, Harkness, Minnow and Peter Pan V. Restless II had a Bosch magneto and Blue Blaze plugs and Saracen also used Blue Blaze plugs and had a Mea magneto.

Two Fast Boats Join Sterling-Powered Fleet.

Two more speedy boats have just been added to the fleet of Sterling-powered racing craft. T. Coleman du Pont, of Wilmington, Del., owner of the Tech Jr., the fast little 20-footer, recently took the six-cylinder engine out of this hydroplane and installed an eight-cylinder 150 h. p. Sterling racing motor. The other boat is the U. U. IV, the 26-foot hydroplane owned by W. and T. Wickwire of Tonawanda, N. Y., which also has one of the 150 h. p. eight-cylinder high speed machines. These engines are similar to those used by John J. Ryan and Commodore J. Stuart Blackton in their Baby Reliances.

The Chicago River Police Service.

The immense water frontage of Chicago, Ill., with a total of 72 miles containing millions of dollars' worth of property, was until two years ago virtually without police protection. Stealing of boats and property along the wharves was the usual thing at night and fairly common in the daytime. In May, 1910, a 25-foot open motor boat powered with a 10 h. p. Holliday motor was put in service and the value of the work done by this boat can best be judged from a partial report of the record for 1911. The river was dragged for 18 cases of supposed suicide, 19 persons were rescued from drowning, 25 bodies were found and stolen property to the amount of $11,000 was recovered. In fact the work done was so efficient that it was decided to put a new and larger boat in service and as a result, on July 27th one of the most completely equipped and efficient police boats in the country was launched for the protection of the Chicago water front. The new boat is 49 feet long with a beam of 11 feet. She has an after cabin, a large engine room and pilot house and is equipped with electric lights throughout, including an under water lamp to lower into the river for locating bodies.

"Billy" Atkin—a rare photograph, as it is the only one taken during the week of the races that shows him standing still.

She has telephone service and is manned by a crew of four police officers acting as captain, pilot, engineer and deckhand. Her jurisdiction is within the city limits and three miles from shore on the lake and she is in service every hour of the day and night. When it came to choosing a power plant for the new boat, the excellent work done by the Holliday in the smaller craft and by larger engines of the same make in other Chicago boats, decided the authorities to install a four-cylinder 40-50 Holliday in the new police boat. This engine gives her a speed of from 11 to 12 miles an hour.

Miller Moves Atlanta Branch.

Chas. E. Miller, the well-known dealer in motor boat and motor car supplies, has announced the intended removal of his Atlanta, Ga., branch store to quarters leased in a building now nearing completion at the corner of Harris and Peachtree Streets. The new address will be 250 Peachtree Street.

Cleveland Supply Company Incorporates.

The Motor Boat and Supply Company, located at 1411-15 West Ninth Street, corner of Frankfort Avenue, Cleveland, Ohio, recently incorporated under the laws of that State. This well-known marine supply house carries in stock a very complete line of supplies and fittings for motor boatmen. The company has issued a handsome illustrated 175 page catalogue which they will be glad to mail to anyone upon request.

Guess Not's Consistent Record.

In the recent Gold Cup Races at Frontenac, the record made by Guess Not showed a remarkably consistent performance for a boat of her size and power, although she was not as fast as some of the other entries. The official times made by this boat are given below. First day's races—1st lap, 18 minutes 52 seconds; 2d lap, 18 minutes 53 seconds; 3d lap, 18 minutes 55 seconds. A total variation of 3 seconds. Second day's races—1st lap, 18 minutes 40 seconds; 2d lap, 18 minutes 51 seconds; 3d lap, 18 minutes 46 seconds. A total variation of 11 seconds. Third day's races—1st lap, 19 minutes 3 seconds; 2d lap, 19 minutes 10 seconds; 3d lap, 18 minutes 59 seconds. A variation of 11 seconds. For the three days' racing the difference between the slowest and fastest laps was 30 seconds, the laps being 10 2-3 miles long in each case. Guess Not was powered with a Watertown motor.

Dirigo Compass on Detroit.

Eugene M. Sherman, of Seattle, Wash., maker of Dirigo oil and electric compasses, has notified us that a Dirigo compass was used on the 35-foot motor boat Detroit in her recent voyage from Detroit to St. Petersburg by way of the British Isles.

A Good Milton Cruiser.

On page 48 will be found the picture of the 35 ft. x 8 ft. cruiser Romona, built by T. M. Milton & Son of Brewerton, N. Y. The boat was designed by the builders and has 6 ft. headroom in the cabin. She sleeps four people and has a toilet, galley, icebox, etc. The cabin is finished in white enamel and mahogany with green upholstery, hangings and carpet. The cockpit is finished in curly cherry, as is also the after deck. The boat is lighted by acetylene gas and is powered with a 20 h. p. two-cylinder Leighton which drives her at about 9½ miles an hour. She is used by her builders principally on Oneida lake and river.

Regal Wins Minocqua Race.

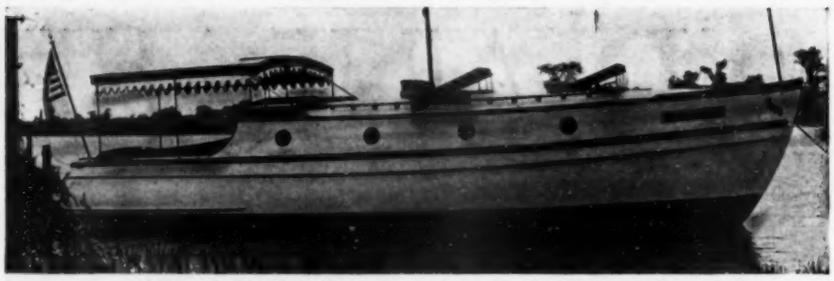
The 48-mile reliability race of the Minocqua Motor Boat Club held on Tomahawk lake, Wis., during August, was won by the 24-foot motor boat Arline. She made the remarkable record of covering the course in exactly the same time on both days of the race. On the second day no contestant was allowed to carry a timepiece. The record is all the more unique because on the first day a heavy west wind was blowing and the lake was quite rough, while on the following day weather conditions were almost ideal with but little wind or sea. Arline is owned by I. F. Fields of Chicago and is powered with a two-cylinder 8 h. p. Regal engine.

Sales and Charters.

The Hollis Burgess Yacht Agency has reported the following sales: the 45-foot waterline auxiliary yawl Siesta, owned by the Edward Hatch estate of Boston to Maitland Alexander of Pittsburg, Pa.; the 45-foot motor boat Tern, owned by Edward Motley of Nahant, Mass., to F. R. Kellogg of New York; the 25-foot waterline sloop yacht Multnomah, owned by Frank Drake of Chicago to Frederick Higginson of Cohasset, Mass.; the 21-foot knockabout Pawnee owned by Geo. H. Collyer of Boston to Phillip L. Smith of New York; the 18-foot knockabout Anne, owned by C. B. Pratt of Manchester, N. H., to W. H. Canterbury of the Boston Yacht Club; the 21-foot raceabout Lethe to J. J. Dyer of the Hingham Yacht Club; the 21-foot sloop Bohemia to a prominent member of the Mosquito Fleet Yacht Club.

Simpson Leaves Ferro.

G. H. Simpson, author of "Marine Engines and Equipment," the Ferro treatise on two-cycle engines, and advertising manager of the Ferro Machine & Foundry Company, Cleveland, Ohio, since 1911, has severed his connection with that company. Mr. Simpson has not as yet made any definite arrangements for the future, but is considering a number of propositions as well as the establishing of a mechanical advertisers' service bureau in Boston or New York. He says, however, that he does not anticipate leaving the marine engine field. The advertising department of the Ferro Company is to be discontinued.



Romona—a 35-footer designed, built and owned by T. M. Milton & Son of Brewerton, N. Y.

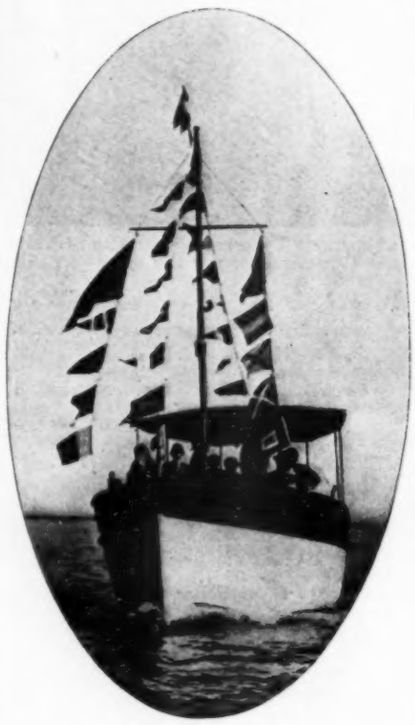
Advertising Agents Add Technical Department.

An evidence of the increasing attention being given to the most efficient methods of advertising technical products appears in the announcement of the formation of Wightman & Richards, Technical Department of Jos. A. Richards & Staff, general advertising agents, Tribune Building, New York City, representing the association of Jos. A. Richards, Lucius I. Wightman and Paul M. Richards. Jos. A. Richards is the head of th e agency bearing his name. Mr. Wightman is an engineer who has for many years specialized in the advertising and marketing of machinery and engineering products and brings to the association several important technical accounts. Paul M. Richards is a publisher, sales manager and advertising man of wide experience. Wightman & Richards bring to the field served by the technical press that much needed combination of agency facilities with technical and engineering skill. The scope of their service includes every proved method of legitimate sales increasing and business building such as the direction and preparation of advertising and advertising literature, mailing lists, sales campaigns, marketing plans and the organizing and systematizing of advertising departments.

New Books for Motor Boatmen.

The Rule of the Road at Sea and Precautionary Aids to Mariners, by Daniel H. Hayne. This manual contains information of much value to those engaged in or about to enter the profession of navigation. The purpose of the manual is to emphasize the necessity of closer co-operation between navigators by direct address to the personal side of the problem and thus secure a more prompt and uniform compliance with the rules designed to prevent marine collisions. The subject matter is so arranged that it may be quickly absorbed, when otherwise the knowledge would be gathered only after many years of experience. To motor boat owners and operators, who daily accept great risks, it should be of much value since in conjunction with the rules, it affords a complete compendium of their duties and responsibilities. The book contains over 165 pages, is bound in cloth and published by the Co-operative Publishing Co., Baltimore, Md., at $3.25 delivered.

Propellers, by Cecil H. Peabody, Professor of Naval Architecture and Marine Engineering, Massachusetts Institute of Technology. This book gives a reliable and convenient method of designing propellers, based on model experiments and free from theoretical intricacies and uncertainties. Tables are given for two, three and four bladed propellers from which the dimensions may readily be determined when the power, speed and revolutions are assigned, either to give maximum efficiency or to conform to certain restrictions such as limited draught. A brief treatment is given of the methods for determining the power required to propel a ship at a given speed, together with data for various types of ships and boats. The designer and builder will find that this book fills satisfactorily a long-felt want. Published by John Wiley & Sons, New York; London, Chapman & Hall, Ltd., 132 pages, 29 figures. Cloth, $1.25 net.



The 30-foot whaleboat cruiser Cachalot built by the New Bedford Whaleboat Launch Co., for T. K. Hastings of New York.

Trade Literature.

The Detroit Lubricator Company, Detroit, Mich., have just issued a new edition of their general catalogue containing 232 pages of information regarding Detroit lubricating devices, valves, etc. The book is a very handsome piece of printed matter and more than that is practically a complete reference work in its field. Readers of MoToR BoatinG will be particularly interested in the mechanical force feed oilers illustrated and described on pages 53 to 66, the oil cups and grease cups shown on pages 67 to 80, and the air cocks, drain cocks, priming cups, etc., on pages 81 to 101.

• • •

The Jacobson Motor Company, Saratoga Springs, N. Y., has issued a leaflet describing the Jacobson marine oil engine which uses kerosene, alcohol, distilate, paraffine, naphtha, benzine and if necessary gasoline, for fuel. The engine operates on the two-cycle principle and is made in 3½, 5½ and 8 h. p. sizes with one cylinder and 7, 11 and 16 h. p. sizes with two cylinders. Specifications and prices of larger sizes are quoted on request.

• • •

The Globe Boat Pattern Company, Newark, N. J. Catalogue showing the various types of motor boats which can be built by the Gere method of boat building from paper patterns. These patterns cover a wide range of designs from the 16-foot open boat to the 40-foot cruiser, and include as well small tenders, rowboats and canoes. Globe patterns are hand made, not machine stenciled, and the markings are in different colors so that each part of the frame and all the fastenings can be readily distinguished in proper relation to every other piece.

• • •

The New London Ship & Engine Company, Groton, Conn. The Nlseco News for August and September. The August issue has as a special feature a discussion of marine installations of Diesel heavy oil engines. A table is given showing the chief characteristics of all heavy oil engined ships that have attracted the attention of the press and short descriptions are given of the more prominent installations principally to show the wide range of adaptability of this type of engine to marine work. The September number deals chiefly with stationary installations.

Lawley Turns Out New Engine.

The Geo. Lawley & Son Corporation have recently perfected and tested their new heavy duty motor at their plant in Neponset, Mass., and the results of the tests which were conducted by the designer, R. N. Atherton, formerly general manager of the Rice Gas Engine Co., have shown the motor to be considerably over rated horsepower and of very low fuel consumption. The motor itself is of the well-known four-cycle type and will be equipped with either jump spark, make-and-break or both systems of ignition. It has many features which are entirely new and exclusive. Several of these motors of the 35 h.p. 4-cylinder type are under construction at the Lawley plant and will be seen at the coming motor boat shows. Sizes up to 100 h.p. will be ready for spring delivery.

Winter Cruising Articles.

Now that the racing season has closed, we are ready again to feature the cruising side of motor boating which the various regattas all over the country have crowded out of the summer numbers. Among the articles that will appear in the near future are a series by Bradford Burnham on a cruise he is about to start in his 28-footer from New York to Florida, up the unfrequented West Coast and thence to New Orleans. There will be a story by Mr. H. E. Handcock, illustrated by the well-known cartoonist Hal Coffman, besides a number of others, all the very best obtainable.

The Racing on the Niagara River.

(*Continued from page 37*)

tried boat at the time of her first appearance at Huntington, has improved wonderfully in speed capabilities at each trip since. For example, her best round of 8.625 miles in the first International Race was at the rate of 39.7 miles per hour while in the last race, under almost similar weather conditions, she averaged 42.6 miles per hour for her best lap. Therefore is it strange that she should average as high as 44.2 miles per hour for her best race at Buffalo?

The method of starting the boats was the best, a system that keeps the drivers informed at all times of just how much time there is before the starting signal. A preparatory gun is fired fifteen minutes before the start and a red flag hoisted; five minutes before, another gun is fired and the flag lowered and thereafter at exactly one minute intervals one of five balls, hoisted in front of the judges' stand and in plain view of all the contestants, is lowered, the number remaining up indicating the number of minutes and fractions thereof to the starting time when, of course, the usual gun is fired.

All of the races were clean, well contested events void of all semblance of fouling; moreover, Mr. Johnson, who was driving the Canadian hydroplane Heloise, once actually slowed his craft down when it appeared to him that he was crowding Mr. Miles in the P. D. Q. too close at one of the turns.

Both Baby Reliance II and Baby Reliance III ran very consistently throughout the 95 miles of racing and Commodore and Mrs. Blackton carried away with them a large share of the beautiful and valuable trophies offered by the Motor Boat Club of Buffalo. Neptune III, the youngest of her family, and owned by Lawrence Buehl of Detroit, was only launched an hour or two before the second day's race. In fact her engines were not in shape or running at the time of the starting gun, but Commodore Criqui would not consent to a postponement even though he may have had a special interest in that particular boat's performance. P. D. Q., the Gold Cup winner, was admired by every one present and Mr. Miles' clean cut method of racing made many friends. The boat, a Dixie, Jr., designed by Tams, Lemoine & Crane and built by the Staten Island Shipbuilding Company, was as easily handled as a runabout, in fact the owner's white driving suit looked as clean when he had finished the series as at the start. No adjustments or repairs were necessary on the engine or boat during the entire meet.

Thelma IV, the entry of the Thelma Motor Works, while not as speedy as some of the others, yet did well. She is a 26 x 4—4 single step Hecker model built by Lemaire of Detroit, equipped with six-cylinder Thelma engine of 160 h.p. turning a Michigan 20" x 34" wheel 1,400 r.p.m., being geared at the forward end to the propeller shaft. The engine and wheel turned at the same rate.

Heloise, the Hamilton winner, ran as consistently as ever, in fact she carried four persons in her cockpit as comfortably and easily as two. Unfortunate accidents put Gretchen III, Question and Reliance IV out of the running early. Sterling engines and Smith-Ryan hulls stood the test as they always do, being the winners in each event.

A complete summary of results is given in Table II.

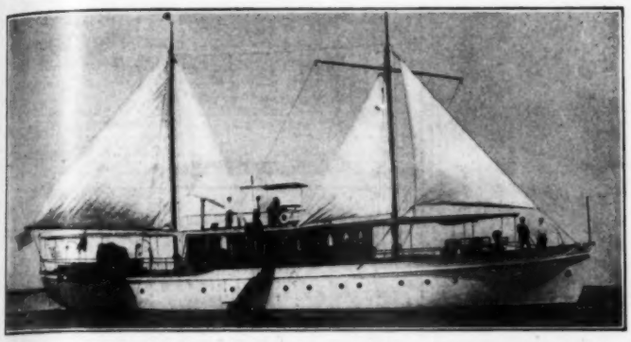
MOTOR BOATING ADVERTISING INDEX

THE MOTOR BOATING MARKET PLACE

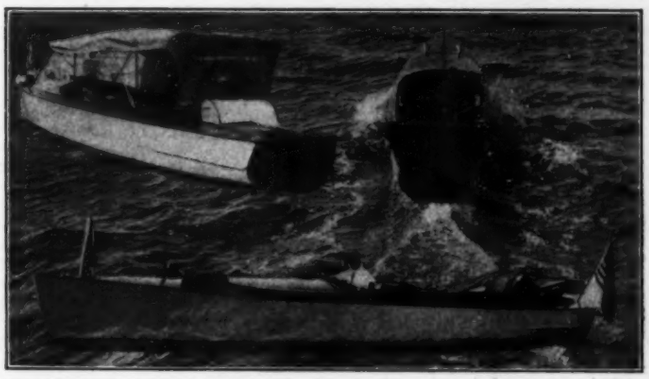
Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.

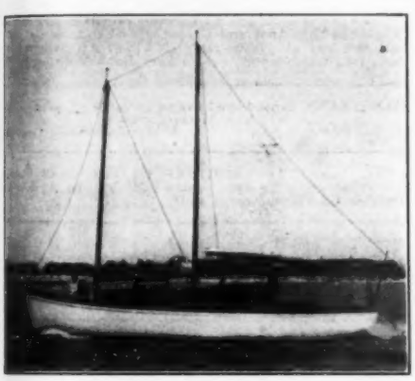
The rate for "For Sale" and "Want" advertisements is 5 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ ins. deep, 1⅝ columns wide..... $3
Cut three inches deep, three columns wide.....$10



PRONOUNCED by competent judges to be the finest boat ever seen in Florida, both for inside and outside work. Draft 55 inches; length 94 feet; beam 18 feet, carried well fore and aft; single screw; Twentieth Century Gasoline Engine, 150 H. P. Price, less than cost, namely, $40,000, not including designer's time and experience with successful result. Apply to owner, care The Hammond Typewriter Co., 69th Street and East River, New York City. Can be seen off shipyard of Gage & Schuchardt, Nyack, N. Y., and tested. Sold only because the owner is planning Lounger III.



FOR SALE.—Express runabout by Skene; 33½ x 6, solid mahogany finished; 60 H. P. Thomas Flyer automobile motor, speed 19 miles; practically new; wonderful sea boat; will sacrifice for quick sale. Write for full description. F. E. Hill, Imperial Furniture Co., Grand Rapids, Mich.



AN EXCEPTIONAL BARGAIN.

36 ft. long, 9 ft. beam, 3 ft. draught. Cost $3,300—will sacrifice before hauling out for $1,800 cash—owner is building larger boat. Actual guaranteed speed 9 miles per hour. She is in perfect condition, fully equipped in every respect, including linen, tableware, cooking utensils, dinghy, etc. She is a wonderful sea boat. Masts, if not desired, can be removed in less than an hour. An ideal cruiser for Southern water, is now in commission and can be seen at any time by applying to H. E. Boucher, 20 Fulton St., N. Y. City.

WANTED—For Long Island Sound—Best Bargain in motor boat between 30 and 40 feet. Offers should include full description, photograph, price and place where boat can be inspected. W. F. Giles, Rookery Building, Chicago, Ill.

36 ft. Cruising Launch for sale. Full inventory. Reasonable. Carl Bruchhausen, 128 East 96th Street, New York City.

RACINE RAISED DECK CRUISER.
36 ft. x 8 ft. 6 in., 10½ miles, an ideal sea boat. five berths, all improvements. 25 H. P. engine. Fine condition. Built in 1910. Asking $1,450. H. J. Jaeger, 68 Hudson St., Hoboken, N. J.

1912 EMERSON 60-70 AERONAUTICAL.
Engine weight 225; used one month; perfect condition; $100. racing clutch included; cost $1,400, will sell for $650. Purchaser can have 15 ft. hydroplane hull if desired. Going after more power. Reeves & Driscoll, 24 Norwood St., Springfield, Mass.

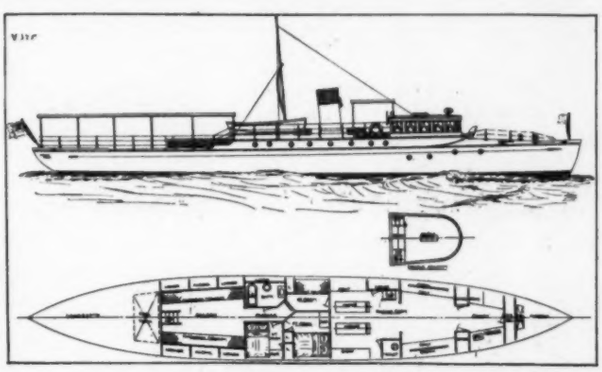
CABIN launch, 22 ft. x 5 ft. New 10 horse Gray. Unusually complete equipment. Electric lights. Complete charging plant. Can be seen by appointment. $350 with equipment; $275 without. R. Bowman, 1822 Tioga St., Philadelphia, Pa.

LAUNCH, 48 x 12 ft. Glass cabin. 24 H. P. engine. Good for cruising. H. A. Perkins, Daytona, Fla.

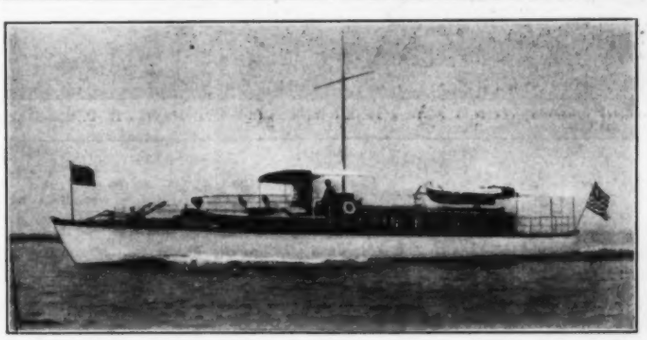
HELP WANTED—MALE.
Man to take charge of yard work, hauling out boats on marine railway, storage for winter, handling men. Good position. Lemuel, care Motor Boating.

10,000 Ferrets for sale. Write for price list and catalog. it's free. DeKleine Bros., Jamestown, Michigan. Box 23.

"PATENT ATTORNEYS"—$10.00 each for the names and addresses of persons interested in patents. For particulars address Post Office Box 2343, Washington, D. C.



2813.—Handsome 92 ft. cruising motor yacht; twin screw; Sterlins motors; in commission and fully equipped for extensive cruising; well adaptable for coast and Florida waters; very roomy accommodations, consisting of dining saloon on deck, engine room and crews' quarters forward; 2 double, 1 single stateroom and cabin aft. Price very reasonable. Full particulars and plans from Whittelsey & Whittelsey, 11 Broadway, N. Y., telephone 4718 Rector.



No. 2754.—For Sale—75 ft. x 14 ft. Motor Yacht adaptable for Florida and coast cruising. Standard motor, 75-90 H. P.; speed 13-14 miles per hour. Splendid accommodations. Two double, one alcove, stateroom, bath and roomy cabin with extention berths. Fully equipped for extensive cruising, all in perfect condition, including motor launch, dinghy, independent electric lighting system, furnishings, bedding, china, silver, etc., now in commission at New York.
Full description and plans on application to Whittelsey & Whittelsey, 11 Broadway, New York. Telephone, 4718 Rector.

BROKEN PARTS WELDED EXPERTLY AND GUARANTEED.
Why risk sending your broken cylinders and crank-cases to inexperienced and irresponsible welders when you can get expert workmanship, prompt service, and fair prices from an old and responsible firm? Write us for estimates and look up our references. What good is a guarantee unless the firm behind it is reputable and responsible? We refer to Dun, Bradstreet, or any Waterbury bank. WATERBURY WELDING COMPANY, WATERBURY, CONN.

FOR SALE—Cigars direct from the manufacturer. Our Factory-to-Smoker System can not be equaled in our prices. Just consider a Havana Filler Cigar. We will send you 100 at $4.00 or 50 at $2.00, express prepaid. This quality of cigars retails the world over at 10 cents. Send in your order or write for particulars today. Address Roland Alexandria Cigar Co., Tampa, Fla.

BEST STEEL HULL LAUNCHES.
We build the best zig-zag double riveted steel hulls on the river. Our own original model 30 ft. 16 gauge steel hull pleasure launch is simply a beauty. Finished in hard oiled oak with four cylinder 35 H. P. Northway engine with latest Remy magneto, easily makes 12 miles against and 20 miles with current per hour on Mississippi River. Price complete, without top, $500.00. Other sizes, too.
ROSEDALE MACHINE & SUPPLY CO.,
Rosedale, Miss.

AUTOMOBILES.
AUTOMOBILE, Marine, Motorcycle Cylinders reground, new pistons and rings fitted. Makes engine equal to new. Write for particulars. Cast Iron Brazing Co., Manchester, N. H.

SECOND-HAND BARGAINS.

No.	Make	H.P.	Cyl.	Rev. Gear	Carburetor	Type	Price
1	Bridgeport	3½	1	No	Vaporizer	Marine	$60.00
2	"	3½	1	No	Carburetor	"	70.00
3	"	5	2	No	"	"	125.00
4	"	5	2	No	"	"	125.00
5	"	5½	1	No	"	"	90.00
6	"	5½	1	No	"	"	90.00
7	"	6½	1	No	Vaporizer	"	90.00
8	"	6½	1	No	"	"	90.00
9	"	9	1	No	Carburetor	"	125.00
10	"	14	2	Yes	"	"	225.00
11	Essex	4	1	No	"	"	50.00
12	Palmer	5	1	No	Vaporizer	"	70.00
13	Truscott	4	1	No	"	"	50.00
14	T. & M.	7	1	No	"	"	74.00
15	Knox	7	1	No	Carburetor	"	85.00
16	"	9	2	No	"	"	125.00
17	Stanley	8	2	No	"	"	115.00
18	Truscott	20	4	Clutch	"	"	200.00
19	Oldsmobile	20	2	"	"	"	200.00
20	Hasbrouck	15	3	Yes	"	"	225.00
21	Bridgeport	2½	1	No	"	Stationary	85.00

Prices are net F. O. B. Bridgeport. All motors have been overhauled and painted—subject to previous sale. Propeller outfits are not included.
Bridgeport Motor Co., Inc., Bridgeport, Conn.

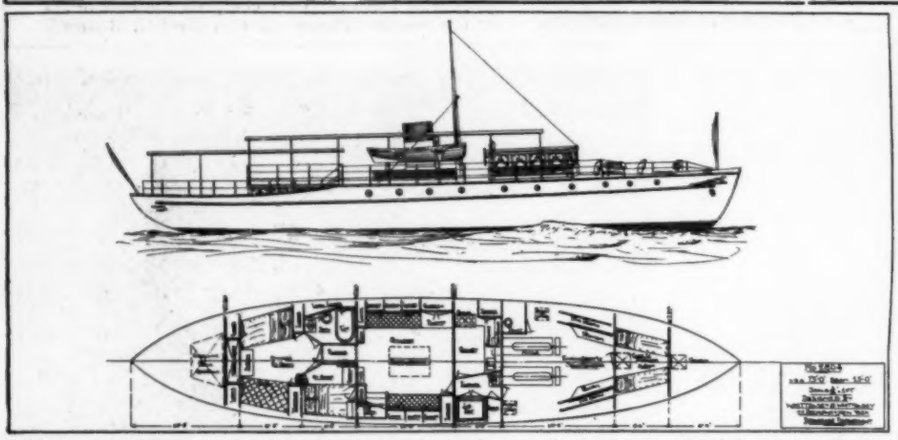
CYLINDERS REBORED—Pistons and rings fitted, new cranks, connecting rods, cases, transmissions, any part for automobile or motor boat motor reproduced like original. Gear cutting of all kinds and materials. Send old part. The shop of quality. McCadden Machine Works, St. Cloud, Minn.

THE MOTOR BOATING MARKET PLACE

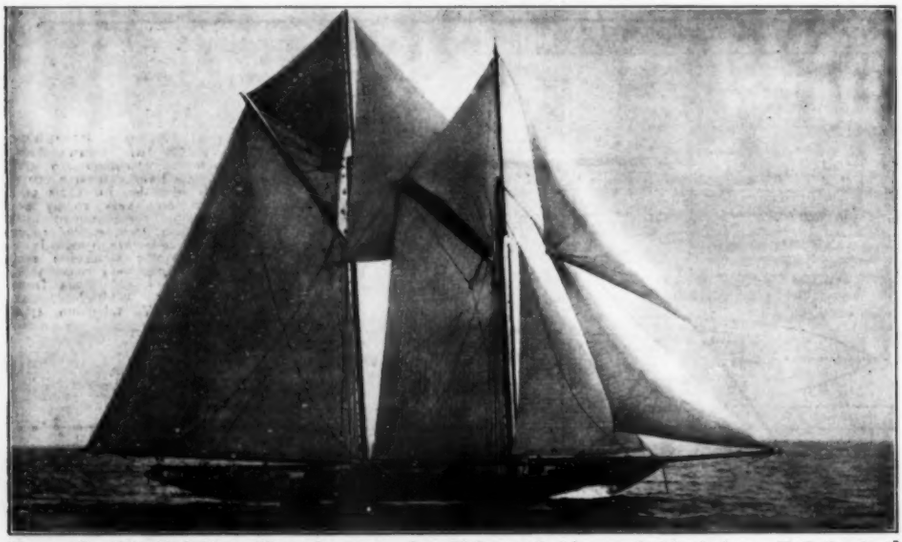
The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, 1½ column wide..... $3
Cut three inches deep, three columns wide.....$10

Opportunities for the Motor Boatman

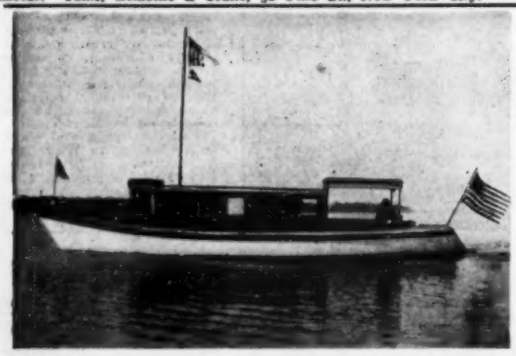
Before you buy or before you sell, examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



OR charter for Florida cruising; handsome motor yacht, 75 ft. x 15 ft., twin screw, Standard engines, electric lighting plant, fully equipped, yacht tender and launch, 2 staterooms, bath, large saloon, pilot house, roomy galley, very able sea boat, price reasonable. Whittelsey & Whittelsey, 11 Broadway, New York City.



No. 97.—For Sale—Desirable auxiliary schooner, 115 ft. x 86 ft. x 22 ft. 6 in. x 13 ft. 6 in. draft; 100 H. P. Standard motor. Tams, Lemoine & Crane, 52 Pine St., New York City.



GREAT BARGAIN

New Dead Rise Cruiser, 40 ft. long, 8½ ft. beam, 30 in. draft. Strongest wood-built boat in America, natural growth timbers, keel and stem all one piece, built 1911, material seasoned in linseed oil. 2,000 galvanized bolt fastenings, heavy plate glass windows, fore and aft. Cabin, 6x6; engine room, 4 x 4; toilet, 2 x 4; sleeps 4; finish, red cedar. New 7 x 7½ heavy duty Fairbank-Victor engine, speed 10 miles. Everything complete: mooring buoy, car, railway. Must be sold. Value $3,000. Price $775. 18 life preservers. Can be seen on Susquehanna Flats, the great ducking ground; not run over 100 miles. Guaranteed for 5 years, will last 25. Come see for yourself. Address

GEO. SLEE & COMPANY,
ABERDEEN, MD.
(Photo shows her running.)

BARGAINS IN NEW ENGINES
to make room for 1913 models.

H.P.		
3	1 cyl. Ferro and reverse gear, 1912.....	$75.00
4	1 cyl. Ferro and reverse gear, 1912.....	97.00
8	2 cyl. Ferro and reverse gear, 1912.....	174.00
11	2 cyl. Ferro and reverse gear, 1912.....	203.00
15	2 cyl. Ferro and reverse gear, 1912.....	257.00
25	3 cyl. Ferro and reverse gear, 1912.....	345.00
7½	1 cyl. Ferro and reverse gear, 1910.....	135.00
5	1 cyl. Ferro and reverse gear.....	65.00

Above prices include carbureter, lubricator and couplings. Full equipment if desired at correspondingly low prices.

MARINE ENGINE & SUPPLY CO.,
121 East Sixth Street, Los Angeles, Cal.

BEARINGS
Ball and Roller—All Types
For American and Foreign Cars
and Motor Boats
Distributor of
"F. & S." "B. A. F." New Departure
Standard (S.R.B.)
Other Makes in Stock
Vixen Files
THE GWILLIAM COMPANY
Broadway and 58th St.
New York.

NEW 54 H. P., six-cylinder Elbridge engine, just from factory. Aluminum manifolds, base and cylinder heads, extra finish throughout. Built for Mr. Coleman du Pont of Wilmington, Del.; exchanged for a larger power. Price $700. Emerson Engine Co., Alexandria, Va.

WELDING.
Cracked Cylinders and all Broken Castings in any Metal SECURELY Welded and GUARANTEED at about one-half the cost of a new part. NATIONAL Welding & Mfg. Co., Incorporated, 527 Jackson Boulvd, Chicago, Ill.

CANADIANS, Second-hand engine bargains. Send for list. Guarantee Motor Company,
73 Bay Street, North, Hamilton, Ont., Canada.

USE "SNAPPER" ENGINES for your small boats. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

SCORED cylinders repaired, $12. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. References, testimonials and full details on request. Waterbury Welding Company, Waterbury, Conn.

A RAISED deck motor yacht, 50 x 8.8 x 3, accommodations for 7; 20th Century Motor; electric lighting; large equipment, like new condition, cost $8,000. Sacrifice half. Take late model automobile part payment. "Florida Cruiser," Box 805, Stamford, Conn.

GASOLINE Engines. 20 H. P. to 60 H. P. Two, three, four cylinder. $100 up. Marine and automobile types. Guaranteed. Universal joints, $4.50. Rear starters, $8.75. Bill Ferguson, 422 Commercial Street, Waterloo, Iowa.

WANTED—For cash before January 1st, flush deck cruiser about 38 ft. by 10 ft., provision for sleeping four or more and complete equipment. Write where boat is, how old, equipment, arrangement, size and photo, if possible. Must be cheap. W. S. Peck, Jr., Syracuse, N. Y.

Annual Buyers' Reference and Export Number

The Annual Buyers' Reference and Export Number, published December first, will be preserved throughout the year by every buyer because it will describe and illustrate every stock boat, accessory, part, etc., on the marine market.

Write us immediately for information regarding the special proposition offered to advertisers.

MoToR BoaTinG
Jos. S. Hildreth, Adv. Mgr.
381 Fourth Avenue NEW YORK

MOTOR BOATING'S circulation offers to advertisers the most concentrated buying power in the marine field. It is read every month by nearly one hundred and fifty thousand people who *should be* vitally interested in your product as motor boat owners, dealers, or manufacturers. Buyers of either of these classes can be reached more cheaply per thousand per month through MoToR BoatinG than by any other equally efficient medium of advertising. This economy of circulation is due to the fact that it is all of the one-hundred-per-cent. kind. Every reader needs your goods and every reader can afford them or he would not be reading the foremost marine magazine. It is only for you to convince him by using space sufficient to attract his attention and to fittingly represent the quality and importance of your product.

Write for advertising rates to

MoToR BoatinG

J. S. HILDRETH, Adv. Mgr. :: **381 Fourth Avenue, NEW YORK**

The Elimination Trials.

(*Continued from page 11*)

16-35, the others being considerably slower. Ankle Deep also made four rounds in 51-32, by far the best showing to date for the distance. Her best time was 12-48 and her slowest 12-57, which showed remarkable consistency even if there was no extreme speed in her, although her total time was only 42 seconds slower than Dixie IV's best time in a race in 1911. Little old Ran came out and showed the new boats how to make 22.5 miles in less than 40 minutes, which was considerably better than most of them had been able to show yet. Minnow managed to make two rounds before she broke one of her shafts, but Baby Reliance II, Saracen, Tech Jr. and Restless II could not get around once all afternoon.

Thursday, at starting time the conditions were again ideal and everyone seemed ready except the committee, so the starts were put off an hour and three quarters, enough time by the way to allow the sea to kick up in fine style. Tech Jr., Minnow and Saracen tried to have a race among themselves after the starting gun at 3.45 but all went out of business within the first mile or two which ended their career for the day.

Later Restless II went the first 30 miles under time in her life in 1-06-00 without very much apparent trouble but her slow time put all likelihood of her being a defender out of question. Peter Pan V, who had not been heard from since her accident on Monday, got in shape again late in the afternoon and went 22½ miles in 38-43 with an average of slightly over 40 miles per hour. This was a very creditable performance considering the conditions and while not quite as fast time as Baby Reliance II had made on Monday, yet it was only 8 seconds slower than Ankle Deep's best time for that distance and much better than any other boat had yet shown.

On Friday the usual afternoon blow was again in evidence and it was after 5.30 when the final day of the trials was started. Nothing wonderful in the speed line developed, however. Baby Reliance IV, the much heralded, made her first appearance, but the best she could do over one lap was at the rate of 27.9 knots. Peter Pan V was out again and her eight cylinder Van Blerck drove her around three consecutive laps in 47 minutes, 36 seconds.

Minnow and Tech Jr., also came out for the grand finale, but one round satisfied each, the former breaking in several planks and the latter catching fire, but both were rescued before much damage had been done.

Big Balaam, a 40-foot displacement boat, owned by Frank Bailey, also tried her luck at speed and while she was able to go the full course of four laps of 30 miles her time of 1 hour, 16 minutes and 12 seconds was too slow to give her a look in. Counting this boat and also the Ran with the aspirants brought the total number up to thirteen, indeed a most unlucky number from more points of view than one.

After much assuming, more figuring and considerable debate, the Committee picked for the American team, as is now well-known, Baby Reliance II, Baby Reliance III, and Ankle Deep.

How We Lost the Trophy.

(*Continued from page 7*)

lost 8 minutes and 7 seconds in getting under way. However, Baby II passed her sister on the way to the first mark and rounded it in the lead, due to the fact that Ankle Deep and Maple Leaf had missed the buoy and had to return to round it.

During the outer leg, all were forced to slow down and Maple Leaf took the lead and held it throughout the remainder of the race. At the end of the first round she led Baby II by 1 minute, 14 seconds, and at the end of the second she had increased the lead to 4 minutes, 44 seconds. At the end of the third lap Ankle Deep had obtained the lead of the American boats, with Maple Leaf 5 minutes, 24 seconds ahead of her, but during the last round Mona came to the front and the finish was in the fol-

(*Continued on page 62*)

How We Lost the Trophy.

(*Continued from page 61*)

lowing order: Maple Leaf, 1 hour, 6 minutes and 25 seconds; Mona, 1 hour, 1 minute, 47 seconds; Ankle Deep, 1 hour, 11 minutes, 10 seconds; Baby Reliance III, 1 hour, 11 minutes, 48 seconds; and Baby II, 1 hour, 11 minutes and 13 seconds.

The Third Race.

WITH Baby II and Maple Leaf each having a race to her credit, the interest in Wednesday's contest was of the keenest. The weather was ideal for the small boats and the prospects looked rosy for America. All of the quintette were in action at the preliminary signal and at 2 o'clock Mona was close upon the line passing it in two seconds. A dozen seconds later Ankle Deep rumbled across followed by Baby Reliance II and Maple Leaf abreast, as shown in the cover picture. Baby Reliance III was 2 minutes, 55 seconds late in starting.

Ankle Deep soon overhauled Mona as did Baby II before the first turn. The Baby seemed to be gaining on Ankle Deep but the second turn was made with the latter boat still in the lead, and Maple Leaf considerably astern. Down the back stretch the two American boats raced but a length apart, the little one completely lost most of the time in the spray of the 32-footer. Rounding the apex of the triangle Ankle Deep still led but upon straightening out on the stretch, the little black, pot-bellied Baby II passed her and led over the line by 2 seconds amid the din of an enthusiastic fleet, and it was 32 seconds later that Maple Leaf crossed.

Never was there a prettier race.

Baby II's time for the first lap was 11 minutes, 17 seconds which is at the rate of 46 miles an hour.

In turning the outer mark, Ankle Deep took the lead, due to a momentary stop of Baby II, who started in time however to preserve a lead of 200 yards over Maple Leaf. This was the order of the leaders at the finish of the second lap, although Baby III had passed Mona, who gave up the race.

Then something went wrong with Baby II. She had lost somewhat on Ankle Deep on the stretch, although still way ahead of Maple Leaf and before rounding the first mark, she died, cutting the chances of an almost certain victory in two.

Traveling with excellent regularity, Ankle Deep completed the third lap, still drawing away from Maple Leaf until her lead was fully three-quarters of a mile. Rounding the first turn she continued on the outer leg with no diminution of speed, but at the second turn something went wrong and in a second she was drifting helplessly a couple of hundred yards down the back stretch. Every nerve was tense and the whole fleet seemed to hold its breath as Maple Leaf closed the gap and all hope of victory fled as she passed the unfortunate boat, one of whose shafts had been twisted off. Ankle Deep's shafts are of bronze but 1⅛ inches in diameter and this was her second accident of this character.

Maple Leaf won the race with Baby Reliance III in second place, and so it was that the Trophy went back home.

Detroit Reaches St. Petersburg.

(*Continued from page 36.*)

outfit furnished the illumination and a Dirigo compass directed her course. Other features of her equipment were the whistle and compressor outfit made by the Gray-Hawley Mfg. Co.; the Columbia batteries made by the National Carbon Co., and the Pyrene extinguisher, which kept her voyage from coming to an untimely end. Her paint and varnish were supplied by the C. A. Woolsey Paint & Color Co. and Berry Bros., Ltd., respectively. Other fittings, such as deck hardware, anchors, etc., were furnished by C. D. Durkee & Co.

Detroit was built by the Matthews Boat Co., Port Clinton, Ohio, and designed by Mr. Wells of that company. She is the property of Commodore Wm. E. Scripps, of the Detroit Motor Boat Club.

The National Carnival.

(*Continued from page 4*)

owned by Mr. P. A. Proal, made the best actual time in this class, averaging a trifle over 25 miles an hour for the 30 nautical miles course, her best lap of 7.5 miles being at the rate of 26.6 statute miles per hour.

Peter Pan V was alone in her class in the series races after the accident to Tech, Jr., as Debutante had trouble also.

In Class D, for the 60-foot cruisers, while only two boats took part, their handicapping was remarkable. In the 22½ nautical miles races, Avis could only defeat Caroline by 13 and 7 seconds, respectively, in their two races, and in the 49-mile run to Peekskill and return, the former won only by one minute, 30 seconds, on corrected time.

Peter Pan, Sr., won three straight heats in Class E, defeating Spindrift, the holder of the title, and in Class F, Alfred S., the yet unbeatable boat of three seasons, again won in straight heats on corrected time. Elise had nearly a walkover in the class for the larger boats, as the others withdrew after one or two heats, when they had sized her up. In Class G, for the smaller open boats, Bunk III met her Waterloo. For two seasons many boats have been after her scalp, but it was not until this series that they were able to come near her, but both Valiant II and Almel took her measure this time, both boats being tied for first place on points in this class.

In the Long Distance Races excellent time was made by Peter Pan Sr., in the cruiser class, which covered the 49 nautical mile course against the tide all the way in just three hours, which is at the rate of 18.75 statute miles per hour. Debutante made three stops on her 104-mile run, due to her unfamiliarity with the course, but nevertheless made the run in four hours and 31 minutes, which is at the rate of 26.5 statute miles per hour.

Class J—Open Boats Over 30 Feet. 22½ Nautical Miles.

CORRECTED TIMES.

Boat.	Handicap.	1st Day.	2d Day.	3d Day.
Elise	25:59	3:12:19	1:57:41	1:59:46
Greyhound	Scratch	3:20:33	2:03:28	D.N.S.
Ourselves		D.N.S.		D.N.S.
Esolanie		D.N.S.	D.N.F.	D.N.S.

Class G—Open Boats Under 30 Feet. 22½ Nautical Miles.

Valiant II	52:00	2:17:58	2:03:17	2:16:09
Almel	Scratch	3:03:45	1:47:43	2:10:27
Bunk III	32:58	D.N.F.	2:05:39	2:03:58
Gray Hare	6:44	3:51:12	2:36:23	2:40:54
Geraldine	16:49	D.N.S.	2:17:33	D.N.F.
Elm	59:48	2:59:50	2:50:09	3:13:55

Class F—Cruisers Under 40 Feet. 22½ Nautical Miles.

Alfred S.	1:21:40	1:54:20	1:51:10	2:05:21
Empire	Scratch	2:18:37	2:14:24	D.N.S.
Canandice	17:34	2:33:28	2:29:39	2:37:12
Idle Time	15:46	D.N.S.	2:24:21	D.N.S.
Ruth II	44:39	D.N.S.	D.N.S.	2:35:29

Class E—Cruisers 40-60 Feet. 22½ Nautical Miles.

Peter Pan Sr.	Scratch	1:46:41	1:27:57	1:32:41
Spindrift	47:38	2:02:14	1:46:13	1:50:30
A. Mietz	25:23	2:24:49	2:13:32	2:13:25
Lady Betty	54:16	D.N.S.	1:44:59	1:47:50

Class D—Cruisers Over 60 Feet. 22½ Nautical Miles.

Avis	Scratch	1:57:01	2:21:05	2:07:46
Caroline	34:24	1:57:14	2:21:12	D.N.S.

Class C—30 Nautical Miles

CORRECTED TIMES.

Boat.	Handicapped.	1st Day.	2d Day.
Peter Pan V	0:00	53:16	1:43:34
Debutante	0:00	D.N.S.	D.N.F.
Tech, Jr.	0:00	D.N.F.	D.N.S.

Class B—Racing Boats Over 40 Feet in Length. 30 Nautical Miles.

Big Balaam	0:00	1:13:22	1:22:19

Class A—Racing Boats Under 40 Feet in Length. 30 Nautical Miles.

Vita	36:08	47:15	54:54
Gunfire, Jr.	20:43	1:03:21	1:03:38
Muirmaid	23:46	0:58:20	1:30:18
Flinders	23:08	1:14:22	1:26:00
Edith II.			D.N.S.
The Limit		D.N.F.	D.N.S.
Bull Moose	24:36	D.N.F.	1:57:33
Humpty Dumpty		D.N.F.	D.N.F.
Mike's Dream		D.N.F.	D.N.F.
Bug	24:57	D.N.F.	2:32:38

Long Distance Races. Class A—104 Nautical Miles.

Boat.	Elapsed.	Corrected.
Debutante	4:31:40	4:13:21
Vita	4:58:05	4:47:39
Flinders	6:08:08	6:08:08

Class D—49 Nautical Miles.

Avis	3:34:34	3:33:34
Caroline	4:49:59	3:35:04

Class E—49 Nautical Miles.

Peter Pan Sr.	3:00:36	3:00:36
Lady Betty	5:32:45	3:34:35
Spindrift	5:24:15	3:40:32
A. Mietz	5:25:51	4:30:35
Fortuna III.	5:24:14	4:51:37

Class F—49 Nautical Miles.

Alfred S.	6:36:48	4:17:12
Canandice	5:54:19	5:54:18
Ruth II.	6:56:19	5:57:20
Alforida	6:36:32	6:24:09

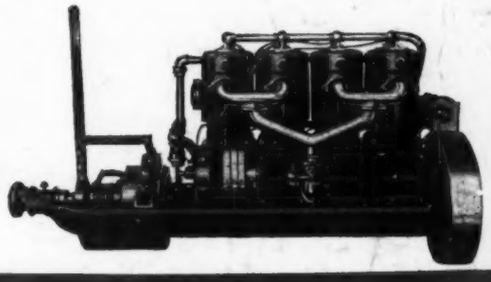
ANDERSON ENGINE

FOR CANOE OR CRUISER

For Work or Play there is but one engine test and that is Performance—**Continuous Performance.**

In Continuous Performance the Anderson engine excels, yes, completely eclipses any engine in its class if you consider first cost, fuel cost and up-keep cost.

Let us prove it. Tell us the Water and the Work to be done. We will tell you the rest.

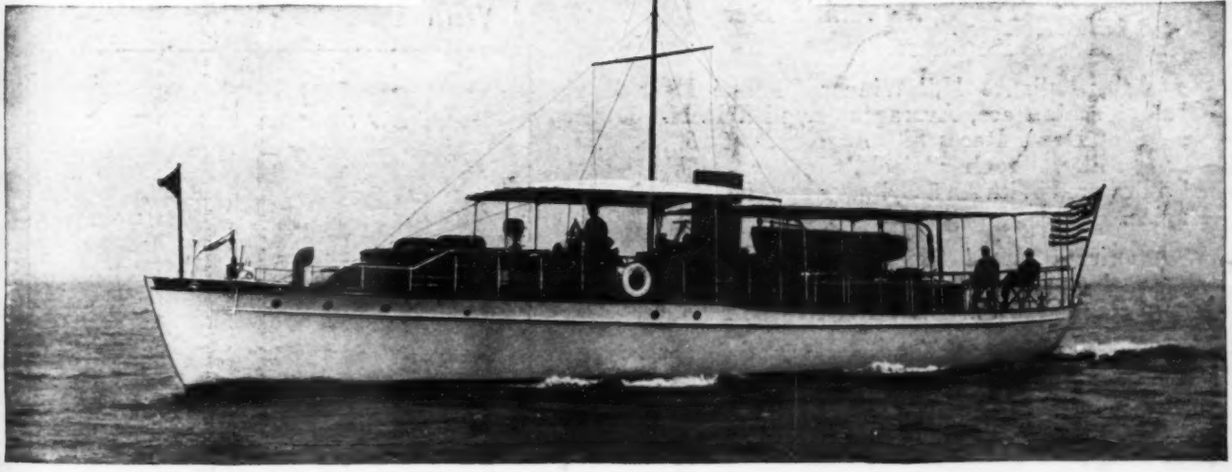


ANDERSON ENGINE CO.

160 North Fifth Avenue - - - Chicago, Illinois

New York Office, 215 E. Hudson Terminal Bldg.
San Francisco Office, 741 Monadnock Bldg.

MATTHEWS CRAFT ASK AN OWNER



MATTHEWS CRAFT ASK AN OWNER

The fifth cruiser of the DOLPH II type is now under way at our yards.

Mr. R. M. Owen, one of the best known automobile men, writes us as follows, concerning his boat of this type purchased this year,—

New York City.

The Matthews Boat Co.,
Port Clinton, Ohio.

Gentlemen:—I am delighted with the ship. She is certainly a dandy and is admired by all my friends. I have had a number of opportunities to sell the boat at a profit, but she of course, is not for sale. I have changed the ignition to high tension and got excellent results.

She is certainly a dandy boat and all you claim for her, and much to my surprise there is not a single change I would make in the boat if I were building another.

Yours very truly,
(Signed) R. M. OWEN.

Every buyer is a satisfied customer. **ASK ANY OWNER**

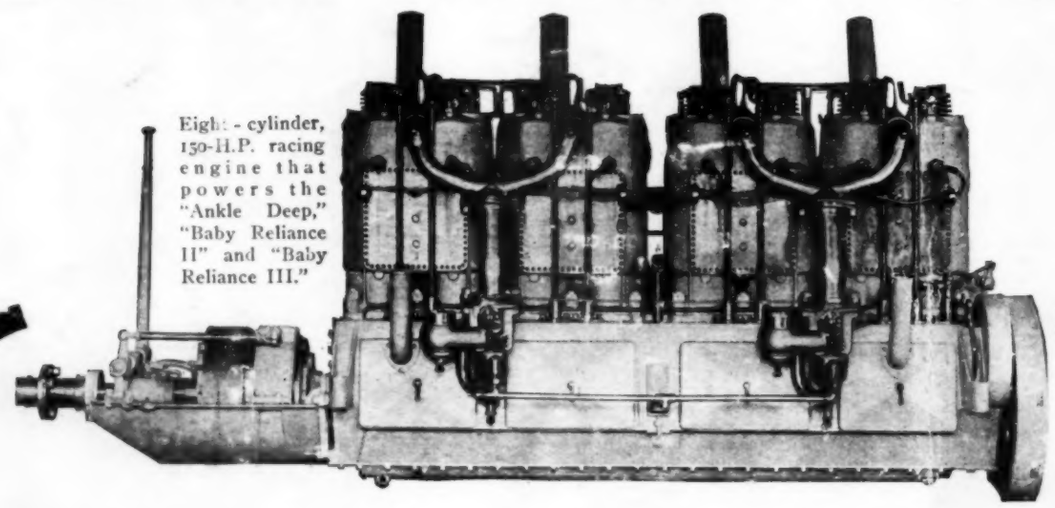
Catalogue and plans for those interested.

The Matthews Boat Company, YACHTS OF QUALITY **Port Clinton, Ohio**

Sterling

THE ENGINE of REFINEMENT

For the finest boats that float



Eight-cylinder, 150-H.P. racing engine that powers the "Ankle Deep," "Baby Reliance II" and "Baby Reliance III."

NEW WORLD'S RECORDS MADE BY STERLINGS

TWENTY-FIVE Miles At The Rate Of **44.51 Miles Per Hour** Is The Official Time Of "Ankle Deep" Made Over The Huntington Bay Course Sept. 4, During The International Races, And Is **A World's Record.** This Pace Had Never Before Been Held By Any Boat. An Unfortunate Accident In Losing Her Propeller And Rudder Prevented This Cup Defender From Winning The Harmsworth Trophy. "Ankle Deep" Is Powered With Two 8 Cylinder, 150 H.P. STERLING Engines.

"Baby Reliance II," Winner Of The First Day's Championship Race, Averaged 42.73 M. P. H. During The Last Day's Races She Averaged 46.06 M. P. H. For 15 Miles, **Another World's Record.** This Boat Is Also Powered With An 8 Cylinder 150 H. P. STERLING Engine.

America Selected STERLING Engines To Power Her **Entire** Team. This Choice Was Made In Open Competition With All American Built Engines.

Read The Story Of The Races In Another Part Of This Magazine And Then Decide Which Engine **You** Want In **Your** Boat.

Four Cycle Engines From 8 To 240 H.P.

The Sterling Catalog Awaits Your Request.

Sterlings Sweep the Country in Every Big Race and Cruise

A Few Sterling Victories:

April 5	St. Augustine, Fla.—"Jane S," 45-65 H.P. engine, wins **Southern Championship of 1912.**
June 15	New Rochelle Yacht Club—"Thistle," 30-45 H.P. engine, wins Spring Regatta for Cruisers.
June 25	New York to Block Island, 100-Mile Race for Cruisers, won by "Thistle," breaking record for course and winning cup for corrected time.
June 29-30	New York to Albany and Return Race, "Thistle" finishes first, breaking record for the course.
July 4	Buffalo, N. Y., "Courier III," 240 H.P. engine, wins Championship of Niagara River.
July 4	Davenport, Ia. Mississippi Valley Power Boat Association Regatta, "Baby Reliance II," 150 H.P. engine, wins 20, 26 and 32-ft. Speed Championships.
July 6	New Rochelle to Stratford Shoal Light and Return, 65-Mile Race for Cruisers. "Thistle" wins first, breaking record for the course.
August 1-2-3	St. Lawrence River, "P. D. Q. II," 45-65 H.P. engine, wins Gold Challenge Cup. "Baby Reliance," 150 H.P. engine, finishes second.
Aug. 12-20	Chicago, Ill. Western Power Boat Association Races, "Baby Reliance II," 150 H. P. engine, wins 26-ft. speed Championship, the Henry B. Clark Trophy and $500 cash; the 40-ft. Speed Championship, the Adam Weckler, Jr., Trophy and $1,000 cash; the Wm. J. Wrigley $22,500 Trophy. "Chicago" (Disturber II) two 100 H.P. engines, wins 10-mile and 15-mile Races.
Sept. 1	Huntington Bay, L. I. "Ankle Deep," 150 H.P. engines, sets world's record for 25 miles at 44.51 m.p.h.

STERLING ENGINE COMPANY

1254 Niagara Street, BUFFALO, N. Y.

NEW YORK, BRUNS KIMBALL CO., 132 LIBERTY ST.
BOSTON, A. P. HOMER, 156 STATE ST.
BALTIMORE, MD., UNGER & MAHON, 119-121 E. YORK ST.
ST. LOUIS, GRANT C. MARSH, 6800 S. LEVEE
TACOMA, WASH., NICKERSON, MACFARLANE MACHINERY CO.
CHICAGO, CHICAGO BOAT & ENGINE CO., 1508 MICHIGAN AVE.
PHILADELPHIA, J. J. FARLEY, BOURSE BUILDING.
SEATTLE, WASH., RACINE BOAT & AUTO CO.
HOUSTON, TEX., BARDEN ELECTRIC & MACHINERY CO.
VANCOUVER, B. C., HOFFAR MOTOR BOAT CO.